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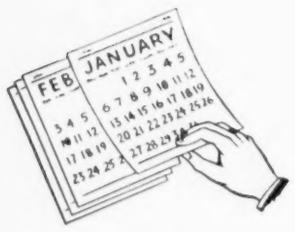
OPPORTUNITY



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As the Editor Views the News

EXULTANT in spite of its penchant for the traditional tone of British reserve, the annual *Trade Supplement* of the *Sheffield* (England) *Telegraph* describes the progress of improvement in Britain's iron and steel industry in glowing terms. One reads that industrial production in the United Kingdom "is back at the 1928-29 level and the number in employment is as great as in October, 1929." Contrasting this with less favorable conditions in the United States, R. G. Glenday writes, "Great Britain decided to continue to pin her faith on . . . the old fashioned creed of individualism, while the U. S. A. embarked on the great adventure of the new deal."

• • •

He cites three great differences in policy. First is that the new deal attempts to encourage higher prices, and "insofar as that policy has succeeded, it has tended to prevent an expansion in general consumption"; in Great Britain prices have fallen and business volume has increased. Second is the difference in rates of interest. The high rate for long term credit, he asserts, "probably is the greatest obstacle to a renewal of private investment in the U. S. A." The third point is that when the crisis came, Britain had a social organization, while the United States had none, "and the tragedy of her immediate destiny is that it cannot be created overnight."

Methods in U. K. and U. S.

• • •

The truth of these observations will not be denied by many thoughtful Americans. As for social organization, the British view is particularly pertinent. As pointed out in STEEL's Yearbook issue (p. 109, Jan. 7, 1935) this country is far behind Germany, England and France in pension experience. Nevertheless, private industry in the United States has done much more in this respect than the federal or state governments. About 150,000 retired employes are drawing pensions from industry as compared with 115,547 receiving pensions from states. Moreover, five million employes in private industry are working under pension systems. In view of such tangible proof that industry has been more foresighted than government in these activities, industry cannot be charged with being antagonistic to the principle of social organization. Industry recognizes the need of something akin to the plan (p. 10) proposed last Thursday.

Industry Alive to Social Needs

• • •

Such misgivings as may be expressed will not be on whether or not we need social legislation. They will have to do with the ability of government to handle the administration of a social program impartially. The proposed laws present unlimited opportunities for political abuse. New avenues for the encroachment of government upon the preserves of private enterprise will be opened. Even the President's message referred to "voluntary annuities," which are directly competitive with services offered by private companies. Nothing President Roosevelt has ever done needs more safeguards against error than do his latest proposals on social "security."

Provide Checks Against Abuse!

• • •

One of the most interesting problems in connection with the manufacture of electric refrigerators is the fabrication of stainless steel evaporator units. The success of one manufacturer in developing a routine for mass production (p. 22) is attributed largely to the method of welding employed. Control of the time current passes through the metal during the welding operation is more important in handling 18-8 steel than in carbon steels. The company adopted thyratron control to insure accurate weld timing. . . . In view of the growing interest in light weight, high strength flat rolled steels, the constructive, cautionary discussion of certain engineering aspects of the application of these steels (p. 27) should receive careful consideration. . . . Arc welding generators were designed for welding, but during the past two years some of them have been purchased for thawing frozen water pipes (p. 31), a use to which they seem to be ideally adapted.

Applying New Steels

E. L. Shaner

"Security" Levies Threaten Heavy Burden on Industry

PRESIDENT ROOSEVELT'S social security program, submitted to congress Jan. 17 in identical bills introduced by Senator Wagner and Representative Lewis, provides, among other things, old age pensions and unemployment insurance which at the outset would cost the steel and allied industries approximately $37,000,000 a year and by easy stages work up to an annual outlay of over $140,000,000.

These estimates are predicated upon the industry operating at the 1927 level, or at 75 per cent of capacity, and do not include the portion to be contributed by employes themselves to the old age pension fund.

First reaction to this program in both the senate and the house in Washington is acclaim for it. Any criticism is that payments under the plan are too modest. New dealers are expected to be for the program as a matter of course, and it is assumed that Republicans cannot afford to oppose it.

State Programs Urged

Simultaneous with the announcement of the President's plan, Secretary of Labor Perkins urged the 44 state legislatures meeting this winter and spring to take appropriate action to develop their own programs of economic security to tie in with the federal plan.

The reaction of industry undoubtedly will be to eliminate its own retirement plans. Apparently, employment stabilization plans conducted by corporations themselves will net them exemption from part of the federal program, but Washington will not be displeased if the trend is to concentrate all unemployment and old age retirement allowances in either federal or state hands.

Briefly, an old age fund is to be set up in the treasury and managed by the secretary of the treasury. This fund is to be supplied by a tax on all payrolls, from which earnings of nonmanual employes receiving over $250 monthly will be exempted.

This tax will be 1 per cent beginning Jan. 1, 1937, 2 per cent beginning Jan. 1, 1942, 3 per cent beginning Jan. 1, 1947, 4 per cent beginning Jan. 1, 1952, and 5 per cent on and after Jan. 1, 1957. One-half of this tax will be deducted by employers from wages

Pensions are to be paid monthly. In the case of employes going on the rolls before Jan. 1, 1942, payment will be 15 per cent of his average monthly wage if taxes were paid in his behalf for 200 weeks, 1 per cent additional for each 40 weeks over such 200 that such taxes were paid up to an additional 200 weeks, and 2 per cent additional for each 40 weeks above such aggregate 400 up to an additional 400 weeks.

How Insurance Is Met

Unemployment insurance is based on a federal tax on payrolls beginning Jan. 1, 1936, which for the years 1936 and 1937 will be 1 per cent if the federal reserve board index of total industrial production remains below 84 per cent of 1923-1925, and 2 per cent if it is between 84 and 95 per cent. But beginning Jan. 1, 1938, the tax will be 3 per cent in any event.

Payments are provided for on a graded scale in the federal employment exchange act, and no worker is to be disqualified from receiving benefits because he has participated in a strike or refuses to accept work at standards below those prevailing in the locality, or because he refuses to join a company union.

These payments, generally, are $15 a week for 16 to 26 weeks, after which workers still idle go on work relief rolls. It is estimated that unemployment insurance will cost the government $98,500,000 the first year and $218,500,000 annually thereafter; the state $75,000,000 the first year and $150,000,000 annually thereafter.

A complicated system of credits makes adjustments for payments into state funds. In fact, one of the purposes of the act is to drive employers into state agreements.

Include Health Provisions

Also in the Wagner-Lewis bill are provisions for maternal and child health, aid to dependent children, appropriations for public health and provisions that individuals may purchase annuity certificates individually from the treasury.

To relate the program on old age pensions and unemployment insurance to the iron and steel and allied industries, STEEL presents herewith a compilation based upon 1927 statistics, that year being chosen because it was a 75 per cent year not touched either by depression or boom.

It should be noticed that the iron and steel industry, as defined by the census bureau, is about twice as large as that included in the steel code. So far as iron and steel proper is concerned, its employment aggregates about 400,000 persons and its payrolls are running at an annual rate of $410,000,000.

Cost of Proposed Social Security Program in 75% Steel Year

1927, in which steel ingot capacity was engaged an average of 75 per cent, is used as a base because subsequent years were abnormally high or low. Pertinent data for 1927: Iron and steel industry—6346 establishments, 835,501 workers, $1,264,000,000 paid in wages. Machinery industry, including foundries, machine shops, machine tool manufacturers, farm implements, mechanical refrigerators, etc.—12,037 establishments, 886,427 workers, $1,287,778,000 paid in wages. The iron and steel industry as defined by the census bureau, from which these data are taken, is about twice the size of that operating under the iron and steel code

OLD AGE PENSIONS

Employment excise tax computed on 1927 level of industry. To be shared equally by employer and employe. Figures are beginning each year indicated

	1% Jan. 1, 1937	2% Jan. 1, 1942	3% Jan. 1, 1947	4% Jan. 1, 1952	5% Jan. 1, 1957
Iron and steel	$12,640,000	$25,280,000	$37,920,000	$50,560,000	$63,200,000
Machinery	$12,877,780	$25,755,560	$38,633,340	$51,511,120	$64,388,900

UNEMPLOYMENT INSURANCE

Tax on payrolls is computed on 1927 level of industry. Employers will receive credit up to 90% of sums paid to state unemployment insurance funds, also credit for state allowance for stabilizing employment. But whether paid to federal or state authorities, the levy on employers will be substantially as follows. Figures are on an annual basis. Rate of 1% for 1936 and 1937 is predicated on federal reserve board index of industrial production remaining below 84% of 1923-25 level; rate of 2% on activity between 84 and 95 per cent

	1% for 1936 and 1937	or	2% for 1936 and 1937	3% beginning Jan. 1, 1938
Iron and steel	$12,640,000		$25,280,000	$37,920,000
Machinery	$12,877,780		$25,755,560	$38,633,340

Labor

SUITS filed last week by employe plan representatives at the Gary works of the Illinois Steel Co. and the East Chicago and South Chicago plants of the Youngstown Sheet & Tube Co. deny the authority of the national steel labor relations board to demand payrolls for an election of employe representatives.

These suits generally paralleled those filed in behalf of employes of the McDonald and Duquesne plants of the Carnegie Steel Co., where elections also have been ordered. Unquestionably, the issue will go to the United States Supreme Court, and in the meantime the Amalgamated Association of Iron, Steel and Tin Workers and the labor board will be stymied.

Its authority definitely challenged, the steel labor board apparently has decided to carry the fight to the bitter end. Last week it ordered a hearing at Portsmouth, O., on Jan. 25 to complete the case of the Wheeling Steel Corp., and at Gadsden, Ala., on Feb. 5 to complete its case against the Gulf States Steel Co.

Similar hearings, but with no definite date, were also scheduled for the Pittsburgh Steel Co. at Monessen and Glassport, Pa., and the Continental Can Co. at Clearing, Ill. An election was ordered at the Acme Machine Products Co., Muncie, Ind.

J & L IS EXONERATED

An interlude in the steel labor board's campaign against the industry was provided in its order dropping charges of the Amalgamated brought against the Jones & Laughlin Steel Corp. at its Aliquippa, Pa., works. The board ruled that apparently both the Amalgamated and Jones & Laughlin were guilty of certain acts of espionage and coercion but that the company had not interfered with the self-organization of its employes.

AMALGAMATED TO RESCUE

A direct attack upon employe representation plans was instituted by the Amalgamated association in a petition to the steel labor board to disestablish the plans at the Duquesne and McDonald plants, where elections have been ordered. This is regarded as reinforcements for the labor board in the defense it will have to present in the suits brought to enjoin the proposed elections.

5-DAY OFFICE WEEK OUT

United States Steel Corp. Jan. 16 announced good news to office and salaried employes in the form of restoration of Saturday morning work and a corresponding increase in pay, or about 10 per cent. This reverses the action taken last Sept. 1, affects 20,000 to 25,000 employes, and indicates that the five-day week for office employes is not yet here.

On Jan. 1 the Jones & Laughlin Steel Corp. restored about one-half of its 16 2/3 per cent reduction in office wages and salaries, thus bringing its employes to the level of other steel companies, excepting of course the new status of Steel corporation employes.

Payrolls distributed Jan. 11 in the Steubenville-Wheeling districts exceeded by over $200,000 the peak of any week of 1934.

This week Meetings, Financial, Washington, Merger, and Institute are on Page 42, Production on Page 59.

Basing Points

CO-ORDINATOR Richberg last week relayed to NRA the federal trade commission's appendix to its report on steel basing points, submitted to the White House Dec. 1. Efforts still are being made to co-ordinate the trade commission's and the NRA separate reports on basing points.

New Capacity

OVER $125,000,000 will be spent by the steel industry for new equipment and plant modernization this year, according to an informal poll of steelmakers recently completed by the American Iron and Steel institute. Improvements are largely for producing lighter types of finished steel products. It is estimated that by the end of 1935 finished sheet capacity will be about 3,000,000 tons more than the aggregate capacity at the end of 1933.

NRA

SCOPE of the hearing to be conducted by the national industrial recovery board Jan. 30 on the labor aspect of NRA will include minimum wage structure, wages above minimum levels, wage differentials, maximum hours, limitations, general labor provisions and further re-employment.

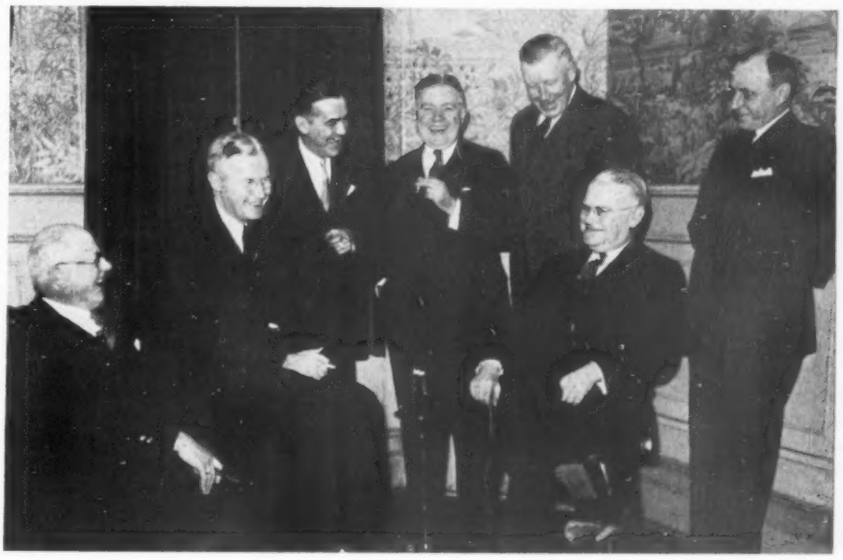
Machine screw nut manufacturing industry is amending its code, to which objections may be filed by Feb. 5, to tighten up contracts at a specified price for an unspecified quantity.

SIGN USED MACHINERY CODE

M. D. Galbreath, president of the National Association of Used Ma-

(Please turn to Page 42)

No Depression Here



As appears evident, optimism was the keynote of the sales convention held by the Kennedy Valve Mfg. Co. in Elmira, N. Y., last month. New lines of Kennedy valves and pipe fittings in course of development and production were shown. Salesmen unanimously reported a highly satisfactory increase of orders late in 1934 and unquestionable indications of greater business improvement in 1935. In the above photograph left to right are F. J. Henkenius, San Francisco branch manager; Clarence H. Kennedy, vice president and sales manager; R. J. Flanagan, Chicago branch manager; J. S. Hanlon, New York branch manager; W. F. Ward, superintendent Kennedy plant No. 2; Matthew E. Kennedy, president; and F. J. Roberts, superintendent Kennedy plant No. 1

Scrap Convention Avoids Taking Stand on Exports

WIDE difference of opinion on putting the Institute of Scrap Iron and Steel Inc. on record as opposing any legislation probihiting or licensing the export of scrap iron and steel resulted in a sharp discussion between eastern and mid-west members at the seventh annual convention, New York, Jan. 15-17.

Introduced originally by Thomas F. Kelly, New York chapter, and favorably endorsed by that regional unit, the resolution was placed before the national organization by P. W. Bowers, president of the New York chapter.

Backed strongly by the New York, Boston and Philadelphia chapters, fireworks followed, consuming a large part of the time for discussion at the open session.

The resolution was opposed by Pittsburgh, Canton, O., and other mid-west members, who fought the stand by the national organization, but favored freedom of action by local chapters as regards a protest against possible governmental limitation on scrap exports.

Open Break Averted

The resolution was finally referred to the board of directors, the ability as a diplomat and parliamentarian, of executive secretary Benjamin Schwartz being required to avoid a wide-open break on the resolution.

Joel Claster, Luria Bros. & Co. Inc., Philadelphia, was re-elected president. Other officers elected are: Chairman, board of directors, Phillip W. Frieder, the Phil W. Frieder Co., Youngstown, O.; secretary, Walter Erman, Erman-Howell & Co. Inc., Chicago; treasurer, Thomas F. Kelly, Brooklyn, N. Y.; executive secretary, Benjamin Schwartz; vice presidents, D. H. Cohen, D. H. Cohen Inc., St. Louis; Darwin Luntz, Luntz Iron & Steel Co., Canton, O.; Harry Silverstein, Midwest Steel Corp., Charleston, W. Va.; Barney Rubine, Hudson Iron & Metal Co., Bayonne, N. J.; Ben Cohen, Louis Cohen & Son, Wilkes-Barre, Pa.

Elected to the board of directors, to replace nine members whose terms expire, were: Ben Cohen; L. J. Workum, Hickman, Williams & Co., Cincinnati; Mr. Erman; M. V. Bonomo, L. Schiavone & Bonomo Bros., Jersey City; P. W. Bowers, P. W. Bowers & Co., New York; Harry Grant, Grant Iron & Metal Co., Detroit; Charles Dreifus, Charles Dreifus Co., Pittsburgh; Dan R. Cohen, D. R. & F. A. Cohen, Chicago; Harry Kirchmann, Alleghany Iron & Metal Co., Philadelphia.

After being told scrap exports approximated 1,800,000 tons last year, or about 18 per cent of the material sold, the debate as to the export resolution waxed hot. A small group of conservatives, both east and mid-west, finally smoothed the turbulent waters. Members opposing the resolution stressed the danger of the national organization going on record.

Joel Claster

Of Luria Bros. & Co. Inc., re-elected president of Institute of Scrap Iron and Steel Inc.

Growing propaganda that heavy exports of scrap were going for munitions was denied by several eastern dealers, although opponents declared this was a factor already operating against the scrap industry from a national publicity standpoint.

Eastern members took the view export volume had been the means of saving their business in some instances, that the policy of the government had been to stimulate export trade, and that the comparatively lower steel mill operating rates in the East as compared with the West was a factor. Exports have also acted favorably on prices in other districts, they claimed, pointing to the close parity of present quotations at Pittsburgh and Chicago.

Western opponents held no objection to export activities by eastern sellers, but stood firmly against putting the national institute on record as opposed to any scrap legislation which might follow. Except for tin-bearing material nothing of a definite policy as to such legislation had been discussed, they claimed. It is generally believed that by referring the matter to the board of directors, the matter will be held in abeyance for the present.

Members of the institute approved a plan for the reorganization of the board, submitted by Mr. Frieder, chairman of the by-laws committee. The plan calls for the reduction of the board of directors of 27 to a total of 19 with a democratic form of selection. The presidents of the 13 chapters of the institute, or some other delegate of the chapters, will become members of the board. Additional members at large will be elected at the annual convention, to make up the total of 19.

Standing committees, under the chairmanship of members of the board, with power to select their own committees from the membership at large, will be appointed to cover the following departments of the industry:

Legislative, relations with producers of scrap, problems of brokers, problems of large yard operators, problems of small dealers, finances, direct dealing and other problems of the industry requiring consideration.

A semiannual meeting of the institute may be held during the summer, to put the plan into legal effect, by the necessary amendments to the by-laws.

Name Five to Code Authority

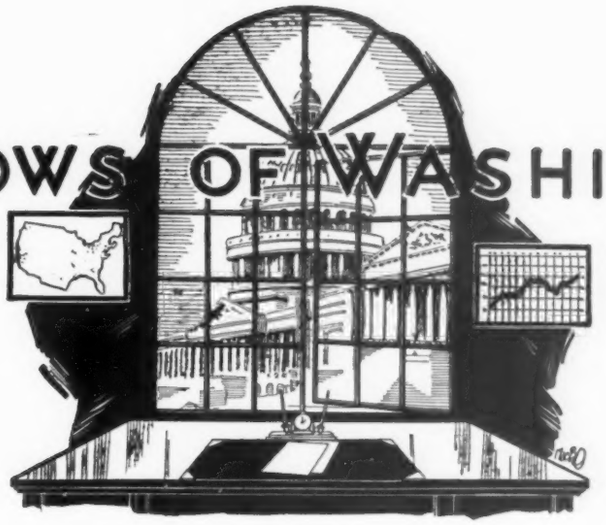
The board elected the following to fill vacancies of five members on the scrap iron code authority, whose terms expire in April to serve as soon as certified by the NRA: Darwin Luntz, Luntz Iron & Steel Co., Canton, O.; Louis Borinstein, Indianapolis; J. V. Kiley, T. J. Kiley & Sons, Boston; Mr. Grant, and Mr. Rubine.

Claiming "direct dealing" between steel companies and their customers, by which scrap is returned on a reciprocal or other basis, is against the best interests of the steel industry and inimical to the national welfare, Mr. Claster recommended that an intensive educational campaign be conducted to establish the vital service which the scrap iron dealer renders to the steel industry and to the national policy of conservation. He urged conferences with the important steel interests be arranged to arrive at a common basis of understanding in connection with the solution of this problem.

"The time has come," declared President Claster, "for constructive and aggressive action, requiring the

(*Please turn to Page* 16)

WINDOWS OF WASHINGTON



WASHINGTON

NO ONE who has a feeling for industry can meander through Washington at this time without sensing an air of uncertainty.

To an extent, this is a sort of fog rolling down from Capitol Hill. While congress has convened and some hundreds of bills have been introduced, active committee work has not yet started, and congress still is a restless, milling throng. Another fortnight, and this will be remedied.

At the same time, the remainder of Washington, meaning thereby the White House and the departments and commissions, can illy conceal a diminution of confidence and assurance, which in turn arises partially in anxiety over congress and the Supreme Court.

Rarely has congress been so unpredictable, despite the supposed Roosevelt halter on it, and the Supreme Court has been giving new dealers the worst case of jitters they have experienced. All this is on top of their amazement that unemployment, in spite of the panaceas they have given the country, remains almost as great as in 1933.

UNEMPLOYMENT A NEMESIS

It cannot be overemphasized that this matter of unemployment is the nightmare of the administration. It constantly breaks through the veil of reform which new dealers are attempting to cast over industry. Some believe their failure to alleviate it will be their undoing.

A good deal of news has been disquieting. Secret fears are expressed at the condition of the railroads. The base of the rise in business activity is not broad enough. Labor is restive in steel, automobiles, textiles. Supposing the Huey Long bloc splits the left wing, to the certain advantage of the conservative bloc.

On the other hand, SEC has simplified its rules for registering securities, expected to lead to refinancing three billions in callable bonds, and other necessary refinancing. Incidentally, had this simplification been effected 90 days sooner Republic Steel Corp. would have been saved thousands of dollars.

Never have new dealers reached out so eagerly for good news. Although the open letter of Tom Girdler, president of Republic, on the future of the steel industry, printed in the daily newspapers of Jan. 14, was primarily a message to recalcitrant Republic stockholders, the glowing picture of the future was so heartening to Washington that everything Mr. Girdler has said about the new deal has been forgiven.

BALKS ON RELIEF BILLIONS

Congress is sullen over the prospect of voting four billions for work relief without having much of a word to say about the patronage. At NRA the atmosphere is funereal, and whether the Blue Eagle is merely molting or has had its tail feathers forcibly plucked is a matter of opinion.

There is no doubt that Washington, since the latter part of December, has been in the trough of the wave, and the President himself is not exempt from this. But as congress swings into action the new deal will get its mind off itself and become less morbid.

THE recent hearing of the industrial recovery board on prices, like the one scheduled for Jan. 30 on labor, appears all the more as scenery in view of the fact that the board has sent to the White House, via Co-ordinator Richberg, three recommendations on the future of the recovery act.

One is for a permanent NRA, with codes reduced to maximum hours, minimum wage rates, and prohibition of child labor. The other recommendations are for a limited or a two-year extension of NRA in its present form.

Majority thought in Washington, especially in view of the temper of congress concerning price fixing, is that all price provisions will be swept out of all codes, but with special consideration for industries seeking it. NRA officially, as also a majority of witnesses at the recent hearing, appears to favor open prices.

Around open prices as great a controversy can arise as over the present price clauses. The crux of open prices is a waiting period; if prices are filed following sales they become historical prices only, but if a waiting period is retained the change from the present system is negligible.

In any event, NRA is coming to see that in the case of steel, base prices are only the core of the apple. If the code authority retains control over extras, it need not worry whether base prices are historical open ones or are filed under present restrictions.

On many products, and some of them common ones, extras are 10 to 15 times the base. Since the steel code became effective Aug. 19, 1933, three books of extras, each larger than the preceding one, have been issued.

BASING POINTS STILL VEX

Meanwhile, the federal trade commission continues presistent in keeping the steel industry on the spot in regard to basing points. In addition to the report sent to the White House Dec. 1, the commission has filed an appendix with certain detailed information concerning the lack of basing points.

There are some in Washington who believe the commission's thunder would be stolen if Bethlehem and Sparrows Point would be

made basing points for all products produced there.

NRA is watching closely the course of a case at Birmingham, Ala., involving the lumber code and possibly leading to a supreme court decision on the features of the recovery act not touched by the recent "hot oil" decision. Federal Judge Grubb, noted for his doubts concerning new deal legislation, recently dismissed an indictment against a sawmill operator for violating the hour and wage provisions of the lumber code, and if NRA appeals the issue may be joined.

Incidentally, the automobile industry is grousing over the steel code provisions requiring forging billets smaller than 4 x 4 inches to be sold as bars.

FEDERAL housing administration is in a somewhat difficult spot at the moment over the impression that has gone abroad that steel houses are cheaper, safer and generally better than other kinds and are ready for the market.

Daily, FHA receives several score of inquiries for plans and specifications concerning steel houses. Its embarrassment is its desire not to dampen enthusiasm for this large potential market for steel, yet the apprehension that some prospective home owners may hold off until steel structures are available.

PUSH "STEEL IN THE HOME"

FHA feels this way about steel. At this time a steel house is a misnomer. What should be pushed by the steel industry is "steel in the home." For the present, it believes the steel industry should stress light sections, probably sheets or strip formed and welded, for use in the interiors, with exteriors of orthodox materials.

To nurse along this budding outlet for steel, FHA believes a minimum of steel consistent with safety and rigidity should be employed. Any attempt to try to load up a house with steel will only defeat the purpose.

Probably nowhere in the country is so much experimental housing construction under way as in Washington and vicinity. Recently a house was constructed with a copper sheet exterior on a steel framework; during erection it was seen that stiffeners for the copper sheets were required every 2 feet, but it was too late to reduce the size of the steel sections designed for 4-foot spacing.

Opinion concerning housing is veering toward this: Slum clearance and other large scale projects have a good chance of succeeding, but individual residence construction will not come up to expectations unless by spring more security in employment has been generated.

The use of steel in fire-resistant structures receives a boost in the manual of fire loss prevention of the federal fire council, which was issued last week by the national bureau of standards. This manual, which can be obtained from the United States government printing office in Washington, is a big 20 cents' worth.

LAST week the interstate commerce commission completed hearings on the freight rate increase case. The railroads, it will be recalled, last fall petitioned for an additional annual revenue of $170,000,000, proposing among other things, an advance in steel freight rates of 10 per cent or not to exceed 2 cents per 100 pounds.

There is a feeling in Washington that the ICC will grant the railroads some measure of relief. In the main, however, the railroads will be asked to await the impact of new measures designed to control their competition.

TO CONTROL ALL TRANSPORT?

This control is a unified government grip on all forms of transportation except air. In many quarters the opinion obtains that the fate of the railroads rests with Co-ordinator Eastman. At the moment, the outlook for a bill for concentration of control is good.

Manufacturers of steel pipe can well look with apprehension upon a movement in congress to enact special legislation to control pipe lines. These lines have always been regarded as beyond the jurisdiction of the ICC, but with supervision of motor trucking and transportation on water and by rail to be tightened, it appears that a federal hand on pipe lines is threatened.

STAINLESS steel received a bad break on the publicity relative to the replacement of gasoline storage tanks on the navy aircraft carrier RANGER.

The fact is, these tanks, storing gasoline for aircraft on the ship, corroded badly, apparently from the combination of salt water and gasoline in the hydrostatic operation of the tanks. Pending an exhaustive investigation, naval officers are not going beyond this generalization.

To replace these stainless steel tanks, galvanized steel tanks are now being installed. But the navy continues to use stainless steel in practically all of the other parts for which it was designed in the new navy expansion program.

The English are experimenting with stainless steel in airplanes and it is understood that similar studies are being made in this country.

SUPERFICIALLY, it appears that forecasts concerning the resumption of trading with Russia after the turn of the year were overly optimistic, yet the fact is Soviet representatives in the past few days have placed orders for machine tools which in the aggregate are fairly large. Most of these orders were accompanied by cash. Large orders for materials and equipment, however, continue contingent upon credit.

Recently, the Soviet has been circulating reports that because of high prices it would buy second lines of equipment. But this is regarded chiefly as propaganda to worry the makers of the so-called first lines into lowering their prices. In most of their negotiations the Russians display considerable canniness.

The first shipments of Russian pig iron to the United States are now afloat, several eastern makers of cast iron pipe having purchased small lots.

Dawes Still Bullish On Steel Industry

ON DEC. 12 Gen. Charles G. Dawes, former vice president, predicted that not later than June or July the beginning of a great sustained demand for durable goods would lift the iron and steel industry out of the slough (STEEL, Dec. 17, p. 13).

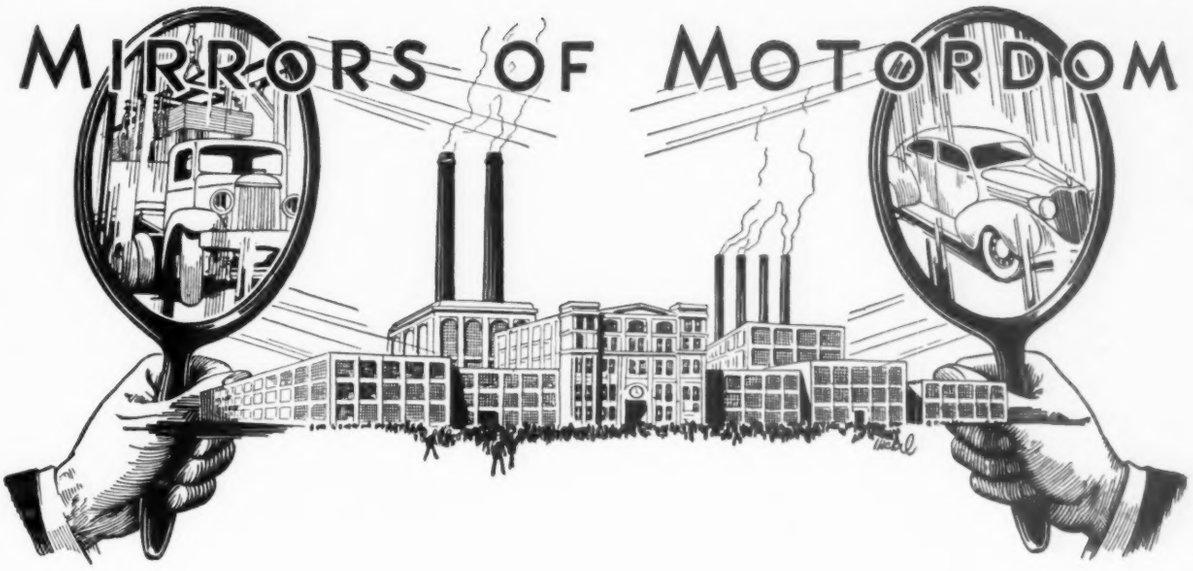
Last week General Dawes declared that his prediction is beginning to come true and that the steel operating rate should be about 15 per cent above its present basis for the reason that the industry will be operating at practical capacity when it reaches 85 to 90 per cent. On this basis STEEL'S estimate of the steel rate for the week ended Jan. 19 at 51 per cent is 8 points too low, and should be almost 60 per cent.

New Demands on Steelmakers

Specifications for steel are more difficult and exacting; orders redistributed evenly; obsolescence the past five years has been heavy—all, according to General Dawes, tending to make 85 to 90 per cent of operations the equivalent of full production. Said General Dawes:

"The present rapid and continuing rise in the mass demand for heavy durable goods is a natural and not a forced rise, and it is a rise which always marks the end of a major depression. Its rapidity, which is also natural, takes many business men unawares.

"This is occurring now and seems to have occurred in a period exactly similar to the present about five and a half years after the start of the major depression of September, 1873."



DETROIT

AFTER making allowance for the ballyhoo and roseate expressions invariably accompanying descriptions of the annual automobile shows, there remains genuine evidence of public buying interest which tends to justify manufacturers' views on probable sales as reflected in their marked increase in assemblies this month.

Attendance at the New York and Detroit shows and at individual showrooms has been heavier than last year, but, more important, orders have increased in most instances. Gains in some cases have been substantial but cannot be accepted as a criterion for the entire industry.

Pontiac, in reporting an increase in assemblies to accommodate heavier retail demand, states that dealers' orders involve more than 40,000 cars. Pontiac's total output in 1934 was less than 80,000 units and this maker now is faced with capacity operations at least to May.

HITTING NEW HIGHS

Hudson's sales at the New York show were about double the 1934 total. December shipments of 8000 cars by Hudson were the largest for that month since 1930. With daily assemblies close to 500, Hudson expects to deliver 10,000 cars this month, three times last year's figure and the best for January in five years.

Visitors to Ford showrooms during the two-day Ford announcement are placed at more than 8,600,000 people, a substantial increase over the attendance at the display of model A. Ford sales recently are reported to be 40 to 50 per cent heavier than a year ago.

Further gains in schedules of other interests support earlier predictions of the most active January since 1930—if production does not top that year's first-month total. During the past ten years January output has represented an average of about 26 per cent of the first quarter's production.

Last year, 1933 and 1932 are not considered in this calculation because of special circumstances which upset operations, such as the tool and die strike in late 1933, the banking crisis early the same year and the steady sinking into the slough of the depression in the fore part of 1932.

Estimates of total assemblies this month still are indefinite because of uncertainty whether some manufacturers will attain proposed goals, but assuming conservatively an output of 275,000, the quarter's figure should reach slightly over 1,000,000 units on the basis of the 26 per cent proportion. A few weeks ago 800,000 was being mentioned as the approximate production likely for the first quarter.

Should the industry turn out 1,000,000 or more cars and trucks in the ensuing three months, it would be a remarkable record considering the fact that this would practically equal or exceed the performance of the first quarters of 1927, 1928 or 1930, years when public buying power was considerably improved over its present status.

The natural assumption is that the industry at the moment is setting its sights too high, that some interference with supplies of material is feared or that retail sales will not match the tempo of manufacturing once dealers are stocked.

RELY ON LATENT DEMAND

While no more infallible than most other business prognosticators, however, motor car builders are boosting their schedules principally because they think their products will sell. Potentialities of demand are tremendous and assured as indicated by the fact that more than 8,500,000 cars now in use are over five years old and more than 12,500,000 are at least four years old.

The extent of further betterment in public buying power and in willingness of John Citizen to spend what money he now has remains the unknown quantity, but most manufacturers, usually optimistic, are betting that Henry Ford's recent statement that "so far as the Ford Motor Co. is concerned the depression is over" will also be applicable to the industry as a whole this year.

DESPITE Ford's dropping stainless steel as headlight material, average consumption of this metal per car by the industry is larger than

Automobile Production

Passenger Cars and Trucks—U. S. Only

By Department of Commerce

	1932	1933	1934
Jan.	119,344	128,825	156,907
Feb.	117,418	105,447	231,707
March	118,959	115,272	331,263
April	148,326	176,432	354,745
May	184,295	214,411	331,652
June	183,106	249,727	308,065
July	109,143	229,357	266,576
Aug.	90,325	232,855	234,810
Sept.	84,150	191,800	168,171
Oct.	48,702	134,683	132,491
Nov.	59,557	60,683	78,415
Dec.	107,353	80,565	.....
Year	1,370,678	1,920,057	2,595,502*

*11 Months.

Estimated by *Cram's Reports*

Week Ended	
Jan. 5	42,003
Jan. 12	59,725
Jan. 19	66,967

it was in 1934. Ford headlights are painted in body colors, only the rim being stainless. This eliminates about 2 pounds of stainless per car, but increased use elsewhere reduces the net loss to about 1½ pounds. The radiator bead is stainless but the windshield frame on deluxe models is chrome-plated.

Other manufacturers offset Ford's curtailed use of rust-resisting metal by additional applications, however, and in view of the good outlook for an increase in total automobile production, stainless steel consumption by the industry may reach a peak.

REFUSE TO PAY PREMIUM

Relatively high cost of stainless in the heavier gages remains a barrier against its more widespread adoption. In brief, the industry is more than willing to use the metal where it will effect a saving in cost over plated material, but when its use represents increased cost, interest cools.

Parts suppliers have been successful in some instances, such as for hub caps and door handles, in wrapping light gage stainless over heavier sections of carbon steel, producing a permanent bright metal finish at considerably lower cost than solid stainless.

For radiator grilles, window and windshield dividing strips, and other parts where the heavier gages are required, manufacturers invariably have turned to the cheaper, plated material despite the relatively brief life of its lustrous qualities.

EXPORT markets are looked to with optimism this year, following a 79 per cent gain in sales in 1934. This compares with an increase of less than 45 per cent in domestic orders. The Automotive Manufacturers' association predicts a further upturn of 38 per cent in export trade for 1935, which, if realized, will mean foreign shipments of more than 500,000 units.

Chevrolet shortly will swell total output of the industry as production is getting under way on master models. The leading producer of cars and trucks last year, Chevrolet has been slower in stepping up schedules than Ford or Plymouth. For the first half of January Chevrolet's assemblies were only about one-half those of Ford and three-fourths as many as Plymouth's.

In addition to displays at the principal motor shows, Chevrolet is sponsoring exhibits that predate these main performances. With music and entertainment for visitors, they are on a scale similar to those conducted by General Motors several years ago in leading centers. One was held here weeks ago and another opened Thursday at Chicago where the general show for all makers starts one week hence. Like the New York show, Chicago's event will be put on by local dealers.

Some automotive companies are becoming interested in activities of tractor manufacturers in developing high-speed units which may curtail the market for trucks in farm districts. With tractors developed to match automotive speeds and with pneumatic tires available to permit operation of such units on all types of roads, one machine could serve the dual purpose of performing the tractor's usual functions on the farm as well as high-speed hauling of wagons on highways. In the latter respect it might eliminate the necessity for a motor truck.

STOCKHOLDERS of independent automobile companies apparently intend to do something to correct the unfavorable position in which these concerns find themselves in attempting to compete with the Big Three. Reports indicate that a move will be made through a group, known as The Automobile Stockholders Consolidation Committee Inc., to merge practically all of the independent companies into a fourth large corporation. Members would include, Auburn, Graham, Hudson, Hupp, Mack, Nash, Packard and Reo. The consolidation would be effected through an exchange of the shares.

RESERVES ARE DWINDLING

There have been discussions in the past by managements of some of these companies looking to a consolidation, but the plans fell through and in this instance executives disclaim having a hand in the move. The economic problem faced by the independents has been particularly apparent the past two years when rising sales in most instances were accompanied by continued losses. Some have been seriously drained of reserves and must stage a comeback this year to escape receivership. While they appear likely to be successful in recouping some of recent losses, the smaller companies face a difficult problem in attempting to meet the competition of the large-scale producer when costs of labor and of some materials to both are equal.

Other industries have found that whenever mergers materially reduce the number of individual companies new units spring up. In many instances the small producer thrives best as a specialist and it is contended by some that such a field exists in the automotive industry as well as in others. There is little to indicate the probable success or failure of this latest merger move, but the difficulties in welding together such a large number of units are apparent and it is thought unlikely that all can be brought to an agreement on terms.

Scrap Body Avoids Stand on Exports

(*Concluded from Page* 12)

united support of the entire scrap iron industry in the solution of this problem. We must know, once and for all, whether we are an essential industry or not.

"When the scrap is needed in time of emergency and the machinery for the collection and preparation of scrap has been disbanded or disrupted, as the result of direct dealing and other practices, it will be too late to revive the industry.

"Great concern is being shown at Washington over the fact that industries which supply vital raw materials in times of national emergency must be maintained and preserved for all time. The scrap iron industry comes within this category.

Lauds Steel Industry

"We recognize that the leadership of the steel industry is characterized by a statesmanlike approach to all problems, that it reckons with elements of the national welfare and public interest and the conservation of natural resources; we have no doubt that this leadership will understand that all these elements are involved in this problem's solution."

With reference to the NRA, Mr. Claster recommended that the scrap iron industry continue playing its part in the recovery program, by observing a code for the industry with only labor provisions, and that no other provisions be included therein. He recommended that the scrap iron industry should be relieved of paying any further code authority assessments, after April 1, 1935.

In view of the fact that the code is essentially a labor code, he stated that the handling and adjustment of complaints involving violations of the labor provisions should be turned over to the state NRA directors, or to some established governmental agency, with the co-operation of the institute.

At the annual banquet which was attended by approximately 400 scrap iron dealers and their guests, the following delivered addresses: Mr. Bowers, chairman convention committee; Mr. Claster, president of the institute; W. W. MacMillan, purchasing agent of the National Malleable & Steel Castings Co., Cleveland; Paul Moss, commissioner of licenses, representing Mayor LaGuardia of New York; R. N. Wilmotte, administration member of the scrap iron code authority; R. L. Harding, chief of the iron and steel division, department of commerce.

Industrial Men in the Day's News

Griswold A. Price, Manager of Sales at St. Louis, Carnegie Steel Co., Illinois Steel Co., Tennessee Coal, Iron & Railroad Co.

—Moffett Studio

He has been in the employ of Illinois Steel since graduation from college, starting in 1919 at Gary, Ind.

After a year there, he was transferred to the Chicago office where he remained for 11 years.

Since 1931 he has been assistant manager of sales for three Steel corporation subsidiaries at St. Louis.

GRISWOLD A. PRICE, new manager of sales in the St. Louis district for various subsidiaries of the United States Steel Corp., as reported in STEEL for Jan. 7, has been associated with the Illinois Steel Co., Chicago, since 1919. In July of that year, following his graduation from Northwestern university, Evanston, Ill., he entered the employment of the company at its Gary plant. After spending one year there and at the South Chicago works he began sales work at the Chicago office.

Employed for about 11 years in the Chicago district sales office and general sales department, he removed to St. Louis on June 1, 1931, as assistant manager of sales in that district for Illinois Steel, Carnegie Steel Co. and Tennessee Coal, Iron & Railroad Co.

In his new capacity he succeeds Stillman W. Wheelock, retired. Mr. Price is a member of the Missouri Athletic association and Glen Echo Country club, St. Louis. During the World war he served as second lieutenant, United States army air service.

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George E. Osborn has been appointed vice president and general manager at Chicago of the western subsidiary of Lamson & Sessions Co., Cleveland. He has been in the employ of the company since 1914, recently in charge of sales in Iowa and the Missouri river territory.

George S. Case Jr., affiliated with Lamson & Sessions since his graduation from college in 1930, in operating and sales capacities, has been named assistant general manager of the Chicago subsidiary company.

□ □ □

E. M. Smith, of the Emsco Derrick & Equipment Co., Los Angeles, has been elected president of General Metals Corp., San Francisco, large casting interest.

□ □ □

William E. Corrigan has been appointed assistant vice president, Railway Steel-Spring division of American Locomotive Co., New York.

George S. Case Jr.

He will have charge of sales of springs, tires and appurtenant parts. Except for a short period during the war he has been active with various departments of American Locomotive since 1909. For the past few years he has been district sales manager at Cleveland.

George E. Osborn

□ □ □

R. C. Woodward has been appointed chief metallurgist of the South Milwaukee, Wis., Erie, Pa., and Evansville, Ind., plants of the Bucyrus-Erie Co., South Milwaukee.

□ □ □

Edward L. Ryerson Jr., president, Joseph T. Ryerson & Son, warehouse interest, Chicago, has accepted a place on the business advisory and planning council of the department of commerce, Washington.

□ □ □

Milton E. Chandler, vice president of the Stromberg Carburetor Co., a subsidiary of Bendix Aviation Corp., South Bend, Ind., has become associated with the Holley Carburetor Co., Detroit, together with a number of associates from the Stromberg company. Reorganization and expansion of Holley business is planned.

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George McM. Godley, for many years a member of the board of the Burden Iron Co., New York, has been elected president of the company.

O. A. Van Denbergh Jr., of Troy, N. Y., recently made vice president and manager of the company, has been elected to the board. These selections fill positions formerly held by the late William E. Millhouse, president.

□ □ □

C. W. Bennett, president of the

American Sheet & Tin Plate Co., Pittsburgh, has retired as president of the Engineers' Society of Western Pennsylvania. F. F. Shaner, vice president of the Equitable Gas Co., has been elected president.

I. Lamont Hughes, president of Carnegie Steel Co., has been elected senior vice president of the society. Arnold Stucki, consulting engineer, Pittsburgh, was named treasurer.

Died:

DR. JOHN ALEXANDER MATHEWS, 62, vice president, Crucible Steel Co. of America, and a metallurgist of international renoun, in Scarsdale, N. Y., Jan. 11. He was director of research for Crucible Steel and developed many refinements in steel and alloy steel products, especially stainless. He was active with the company for 33 years, following his return from England where he studied at the Royal School of Mines.

Dr. Mathews was awarded the Andrew Carnegie gold medal for research in 1902, when he started to work for Crucible Steel at Syracuse, N. Y. Transferred in 1908 to the Halcomb Steel Co. division, he was president of the latter company from 1915 to 1920. For a year he was vice president of Crucible Steel and in 1921 became president. After three years, he became vice president again, to devote more time to research. Dr. Mathews pioneered many developments in high-speed steels.

In 1924 he delivered the Howe memorial lecture before the American Institute of Mining and Metallurgical Engineers and in 1928 was awarded the Robert W. Hunt medal of that society. He was an honorary member of the American Society for Metals.

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Perry D. Mackey, 68, well known in the early days of the steel industry and an early associate of Alva C. Dinkey, Charles Schwab, Capt. William Jones and William E. Corey, at his home in Collingswood, N. J., Jan. 10. He began his career with one of the first bessemer plants in the country at Bellaire, O., and subsequently was the first superintendent of the bessemer plant of the Republic Iron & Steel Co., Youngstown, O. In later years he was connected with the Colorado Fuel & Iron Co., Denver; Illinois Steel Co. at its Gary, Ind., works, and Bethlehem Steel Co., Bethlehem, Pa. He built and operated the Cleves, O., plant of the Phoenix Horseshoe Co., but has been retired for a number of years. However, he retained his interest in the steel industry and at the time of his death was assisting in an important steelworks improvement.

John A. Mathews

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John E. Wetzel, 49, vice president of Superior Steel Corp., Pittsburgh, in an automobile accident at Berwyn, Pa., near Philadelphia, Jan. 12. He was associated with the Superior Steel Corp., Pittsburgh, since 1915, successively as district sales manager in Philadelphia, sales manager and more recently vice president in charge of sales. Previously he had been employed by Sweets Steel Co., Williamsport, Pa., and Henry Disston & Sons Inc., Philadelphia.

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Frank G. Wright, 63, retired vice president of the Ohio Steel Foundry Co., Lima, O., at his home in that City, Jan. 11. Born in Oldham, England, he came to this country in 1874. Former business connections include the Josaph Reid Gas Engine Co., Oil City, Pa., and American Steel Foundries. He was manager of the Indiana Harbor, Ind., plant of the latter organization until 1912.

John E. Wetzel

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Bernard E. Prather, 50, assistant superintendent of erection, Allis-Chalmers Mfg. Co., Milwaukee, Jan. 14.

□ □ □

Robert M. Mears, 53, president and general manager of the Standard Steel Wire Co., Greensburg, Pa., in that city, Jan. 17.

□ □ □

Lee R. Sheer, 53, for 25 years vice president of the Sheer Bros. Fence & Iron Co., Cleveland, in that city, Jan. 17.

□ □ □

Walter McGhee, 49, vice president of the Enterprise Can Co., McKees Rocks, Pa., in Crafton, Pa., Jan. 12.

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John A. Henry, superintendent of the inspection department, Homestead steelworks, Carnegie Steel Co., Pittsburgh, in that city, Jan. 10.

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Joseph G. Sailer, 68, one of the founders of the Sailer-Whittmore Foundry & Machine Co., Menasha, Wis., Jan. 10.

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Harry F. Ferguson, 47, former president of the American Society of Civil engineers, and recently chief engineer of the Illinois state division of sanitary engineering, in Chicago, Jan. 16.

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Fred L. Gardner, 72, vice president and co-founder of the North Dakota Metal Culvert Co., Fargo, N. Dak., in that city recently. He and the late W. H. Jenkins organized the company in 1906.

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M. T. Colley, 51, chief clerk of the voucher bureau for Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., at his home there, Jan. 12. He had been connected with the Tennessee company for 27 years.

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Charles W. Conrad, since 1909 identified with the industrial engineering department of the Carnegie Steel Co., Pittsburgh, in that city, Jan. 10. During his earlier business career, he was identified with the Bethlehem Steel Co., Bethlehem, Pa.

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Thomas M. Phillips, 66, former superintendent of the Brier Hill Steel Co.'s wash metal plant, and former vice president and manager of the Youngstown Steel Co., in a Youngstown, O., hospital, Jan. 16. At the age of 18 he started work in steel mills. Later, after building and operating a puddling mill at Pueblo, Colo., he went to Youngstown. In the period 1922-24 he was general manager of an experimental mechanical puddling mill at Warren, O., built by American Puddled Iron Co.

EDITORIAL

Auto Shows Reveal Effect of Cost-Volume Cycle

NO PERSON can attend any of the major automobile shows being held in the principal cities this month without being impressed by the importance of the roles which iron and steel play in the 1935 models. At the same time, anyone who is familiar with the distribution of iron and steel products must recognize the commanding importance of the motor car industry, not only in the consumption of these products but also in the tremendous influence which it exerts upon quality of materials, methods of production and processes of fabrication and manufacture.

The modern automobile—and particularly the type which is rolling off the assembly lines this year—furnishes a remarkable illustration of what can be accomplished when the skill and resources of all divisions of industry from mine to finished article are united with efficiency in distribution in the development of a product which caters to a broad consuming market.

The 1935 cars are the result of cumulative progress in this respect. In the early days of the automobile—in the period in which it was referred to as a "horseless carriage"—the pioneers in the field had to use the materials and methods then available. These were principally the metals and processes which previously had been developed for agricultural implements, cars and locomotives, bicycles, sewing machines, etc.

Motor Car Industry Gradually Developed Materials and Methods for Its Special Needs

As the infant automobile industry gained strength, it began to feel the need of materials and processes better adapted to its purpose. Gradually it developed specifications of its own, and before long steel producers, mill interests, forge shop operators, foundrymen and other suppliers were furnishing material developed particularly for automotive demand. Concurrently, the processes of manufacture and assembly of parts were undergoing drastic changes, which in time led to what is known as the "mass production" method.

Naturally the progress in these two directions —materials and methods—resulted in a lowering of costs. The industry passed a liberal share of this reduction to its customers. Thus was set in motion a cycle of cause and effect which has become the marvel of this century. Lower costs, and consequently lower selling prices, opened the way to greater volume. Increased volume permitted either a further reduction in unit costs or the improvement of the product, or a combination of both.

The 1935 shows reveal the extent to which this cycle has enabled builders to offer amazing values for the automobile purchaser's dollar. One wonders whether there is any other article of intricate design and construction which affords as much value to the buyer for the money as does the average automobile of 1935. One also is prompted to ask to what extent the price appeal of these new models attracts funds from the public's pocketbook, which, until the shows were held, had been earmarked for household expenses or expenditures of other kinds.

Operations of Sheet Industry Revamped Thoroughly To Meet Problems of Auto Industry

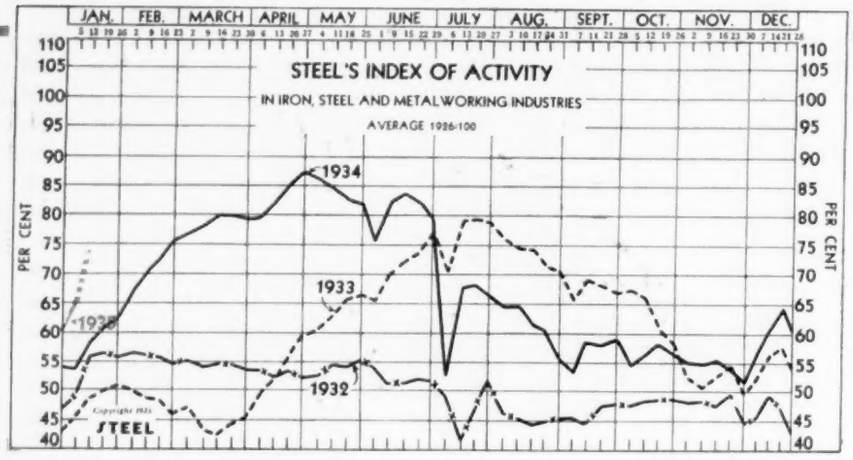
How far reaching are the developments which contributed to this strong price appeal is illustrated by the recent history of the production of strip and sheet steel. The great volume of demand for flat rolled material for fenders and bodies was largely responsible for the introduction of continuous mills and for a long series of other developments and refinements in the rolling of sheets and strips.

The result is that today the production of automobiles involves the use of some materials and methods which were not available on a mass production basis as recently as five years ago. Some of these new contributions have been important factors, not only in reducing the price of cars to consumers, but also in extending the automobile consumption of steel.

In 1934 the motor car industry took 55 per cent of the country's output of strip steel, 42 per cent of its bars and a like percentage of its sheets, about 10 per cent of its wire products and 5 per cent of its pipe and tubing.

Some of the principles which have worked so well in the automobile industry for the benefit of automobile builders, the public and the iron and steel industry, might well be adopted by the railroad equipment and building construction industries. In both cases there is potential volume awaiting the lure of lower costs Particularly in the building industry, in which FHA is working so feverishly, the lesson of the automobile industry should be heeded.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained* 8.5 *points to* 73.9 *in the week ending Jan.* 12:

Week ending	1934	1933	1932	1931
Nov. 24	54.4	55.4	44.5	54.8
Dec. 1	51.9	49.7	45.3	51.4
Dec. 8	56.8	52.6	46.6	52.9
Dec. 15	60.6	56.0	49.3	53.1
Dec. 22	64.4	58.0	46.9	52.3
Dec. 29	60.8	53.7	42.9	46.8
	1935	1934	1933	1932
Jan. 5	65.4†	53.6	45.3	48.8
Jan. 12	73.9*	58.1	48.6	55.8

†Revised. *Preliminary.

Industrial Activity Continues To Expand Rapidly

SO SHARP has been the advance in many barometers of industrial activity in the first three weeks of January that it must be ascribed to the combination of several favorable influences and not to the result of any single factor.

Of course the outstanding impetus for improvement comes from the automobile industry, which has been stepping up production on new models rapidly since the middle of December. But even this spectacular expansion in the activity of the consuming industry, which in 1933 and 1934 took one-fifth of all the finished rolled steel produced, cannot account for the sharply rising rate of steelworks operations.

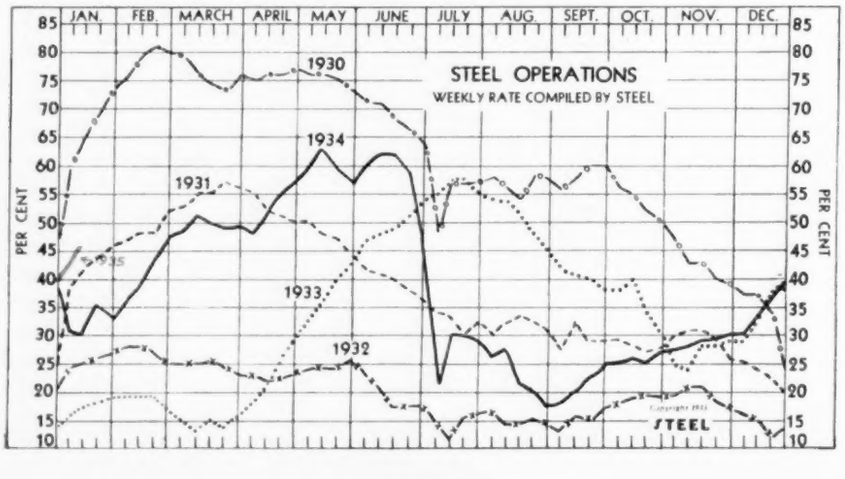
From a rate of 30 per cent in the week ending Dec. 8, operations have increased swiftly and steadily to around 50 per cent in the week ending Jan. 19. This rise, while due in a large measure to the automotive influence, also reflects a healthy expansion of demand from many other industries. This point is emphasized by the marked improvement reported in districts in which purchasing for automobiles is a minor factor.

This is reflected in the weekly reports of car loadings and electric power output. Revenue freight traffic, always expanding at this time of the year, has increased sharply in the last three weeks—the gains being well distributed over all districts. Electric power output in the week ending Jan. 12 was the second highest in four years.

Rising Steel Rate, Auto Output, Car Loadings and Power Output Send Index up to 73.9

As a result of sharp increases in all of the four barometers, STEEL's index of activity in the iron, steel and metalworking industry jumped from a revised figure of 65.4 for the week ending Jan. 5 to 73.9 for the week ending Jan. 12.

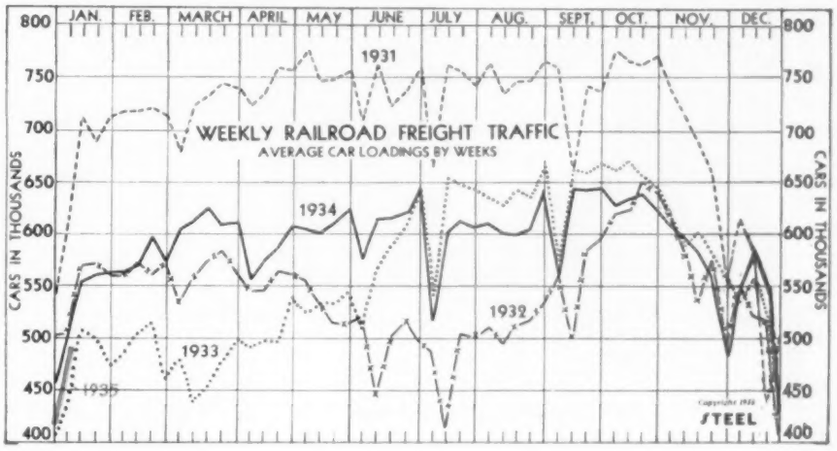
1935	Per Cent
Jan. 12	45½
Jan. 5	42½
1934	
Dec. 29	39
Dec. 22	37½
Dec. 15	33½
Dec. 8	30
Dec. 1	28
Nov. 24	29
Nov. 17	28
Nov. 10	27½
Nov. 3	27
Oct. 27	25½
Oct. 20	26½
Oct. 13	25
Oct. 6	25



1934	Per Cent
Jan. 13	30
Jan. 6	31
1933	
Dec. 30	36
Dec. 23	38
Dec. 16	33
Dec. 9	29
Dec. 2	29
Nov. 25	28½
Nov. 18	28
Nov. 11	24
Nov. 4	25
Oct. 28	30
Oct. 21	34
Oct. 14	40
Oct. 7	38

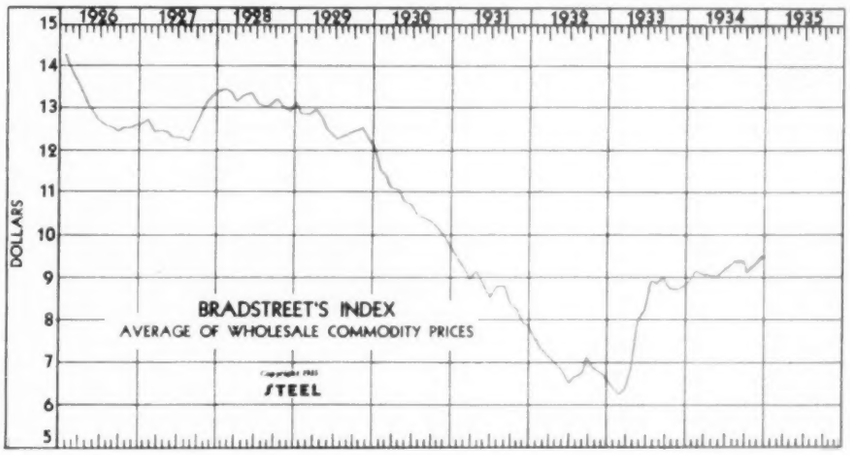
Freight Car Loadings Advance Sharply

1935		1934	
Jan. 5	498,073	Jan. 6	500,813
1934		**1933**	
Dec. 29	425,120	Dec. 30	454,765
Dec. 22	547,895	Dec. 23	531,464
Dec. 15	579,935	Dec. 16	559,419
Dec. 8	551,011	Dec. 9	541,992
Dec. 1	488,118	Dec. 2	499,596
Nov. 24	561,313	Nov. 25	585,738
Nov. 17	584,525	Nov. 18	602,708
Nov. 10	594,932	Nov. 11	583,073
Nov. 3	612,457	Nov. 4	614,136
Oct. 27	624,252	Oct. 28	642,423
Oct. 20	640,280	Oct. 21	657,005
Oct. 13	635,639	Oct. 14	670,680
Oct. 6	631,318	Oct. 7	662,373



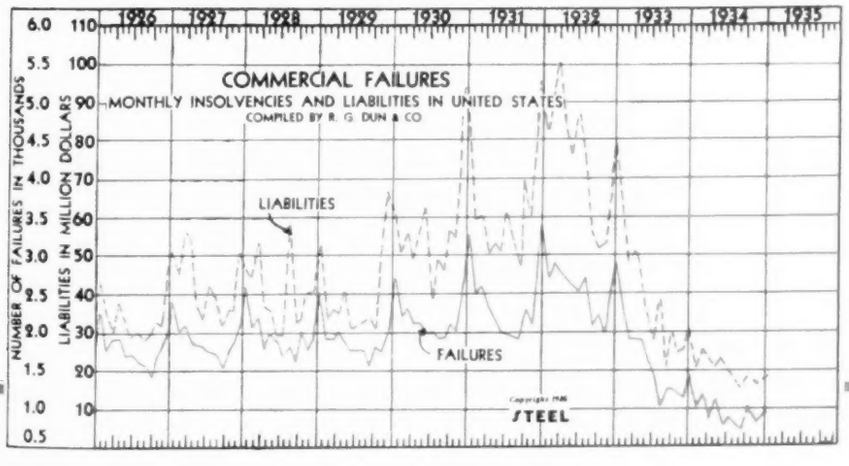
Bradstreet's Index Highest in Four Years

1933	
Jan. 1	$6.53
Feb. 1	6.35
March 1	6.54
April 1	6.98
May 1	8.02
June 1	8.34
July 1	9.01
Aug. 1	8.99
Sept. 1	9.05
Oct. 1	8.84
Nov. 1	8.81
Dec.	8.83

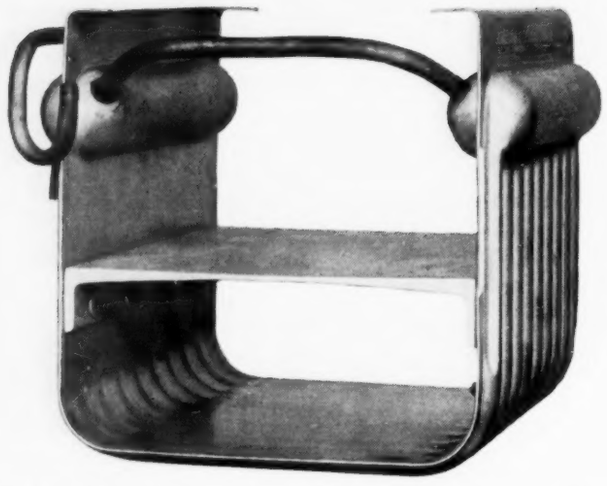


1934	
Jan. 1	$9.01
Feb. 1	9.26
March 1	9.17
April 1	9.16
May 1	9.14
June 1	9.24
July 1	9.32
Aug. 1	9.48
Sept. 1	9.45
Oct. 1	9.27
Nov. 1	9.29
Dec. 1	9.49

Business Failures Continue at Low Ebb



	Failures		Liabilities	
	1934	1933	1934	1933
Jan.	1,364	2,919	$32,905,428	$79,100,602
Feb.	1,049	2,378	19,444,718	65,576,068
Mar.	1,102	1,948	27,227,511	48,500,212
Apr.	1052	1,921	25,786,975	51,097,284
May	977	1,909	22,560,835	47,971,573
June	1,033	1,648	23,868,293	35,344,909
July	912	1,421	19,325,517	27,481,103
Aug.	929	1,472	18,459,903	42,776,049
Sept.	790	1,116	16,440,147	21,846,906
Oct.	1,091	1,206	19,968,448	30,581,976
Nov.	923	1,237	18,349,791	25,353,376
Dec.	963	1,132	19,910,610	27,200,432



Fabricating Evaporators

Fig. 1—A finished electric refrigerator evaporator made from formed and welded 18-8 stainless steel

EVERY new use for stainless steel expands its consumption and hastens the day when by virtue of larger tonnage it can be produced more economically and sold at a price which will promote still wider application. When a large volume market is attained, stainless steel makers and users alike stand to gain. Acceptance of corrosion-resisting steel has grown at an encouraging pace despite several years of unfavorable industrial activity and this is a certain indication that under normal conditions relatively greater progress could be expected. New uses being found for the material give much hope for the future.

One of the notable applications for 18-8 chrome-nickel stainless steel during the past two years has been for electric refrigerator evaporators, an application which has been pioneered by the General Electric Co., Schenectady, N. Y. For this use, the material has proved eminently satisfactory. No difficulty has been encountered in forming the sheets or welding the assemblies together and the finished units have met all demands of service.

The function of the refrigerator evaporator is to cool the food compartment and to freeze ice cubes. Located inside the food compartment, the evaporator contains the refrigerant, which, in being converted from a liquid to a gas, extracts heat from the compartment. The gas then is pumped out by the compressor into the condenser where it dissipates its heat to the air and returns to liquid

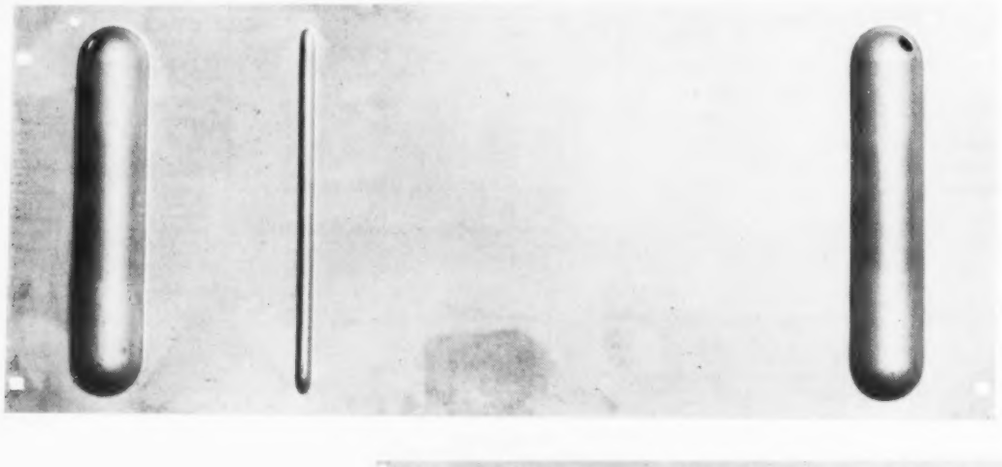


FIG. 2—The inside sheet of the evaporator on which the two headers and liquid inlet channel are formed and several holes are punched

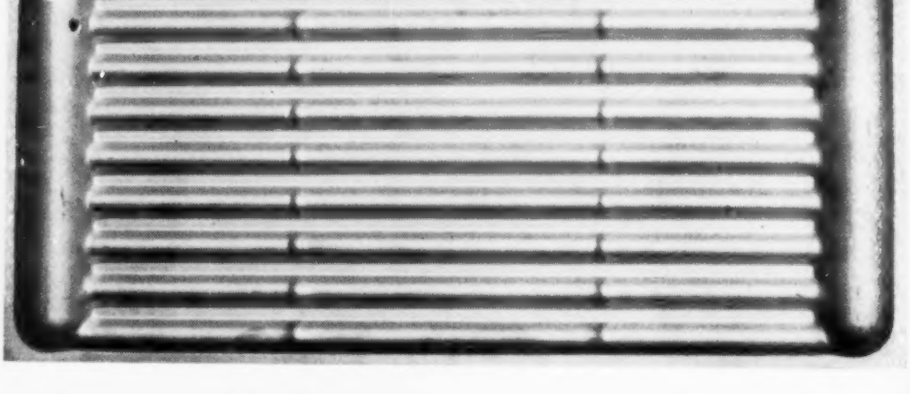


FIG. 3—Two headers and nine connecting corrugations to serve as refrigerant passages are formed in the outside sheet, which is slightly shorter and narrower than the inside sheet

Refrigerator from 18-8

BY E. F. ROSS
Associate Editor, STEEL

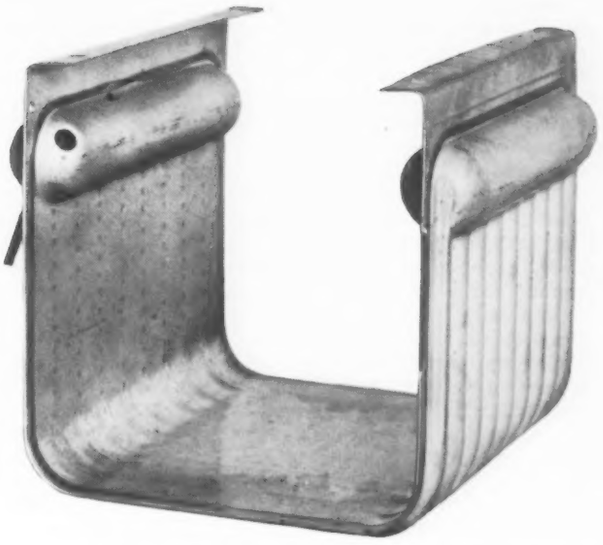


Fig. 5—After welding is complete, the assembly shown in Fig. 4 undergoes its final forming operation

form ready to be discharged once more into the evaporator.

Because the evaporator collects moisture and becomes heavily coated with frost, it must be rustproof; furthermore, it must have a finish which is not easily cracked or marred and which can be cleaned easily. These conditions are met fully with 18-8 stainless steel. The refrigerant, methyl formate or sulphur dioxide, is not corrosive, consequently it did not influence the choice of material; the choice was made solely on the basis of the exterior surface which must not rust or corrode under any circumstances imposed in service.

In its Schenectady plant, General Electric manufactures two types of evaporators for several models of monitor-top refrigerators and all of the evaporators for its small, low-priced lift-top refrigerator placed on the market early last summer. Facilities are provided in this plant for making 6000 monitor-top evaporators and 5000 lift-top evaporators per week; the company's Fort Wayne, Ind., plant has capacity to make an additional 3000 monitor-top evaporators per week.

The 18-8 sheets for evaporator fabrication are purchased from the mill with the customary cold-rolled finish and in the annealed condition. Blanks are purchased to size to eliminate scrap loss. No difficulty is experienced in forming this material because the drawing operations are not severe. A liberal radius is used in all drawing and this eliminates the possibility of tearing the steel. It has been found important, however, for all die corners to be highly polished to produce a smooth flow of the metal and prevent scratching.

A suitable drawing compound is employed for all forming operations. The sheets are coated completely by immersion in the solution and are then allowed to drain. After drawing, the sheets are racked so that the excess drawing compound drains off. After the drawing, trimming and piercing operations are finished, the drawing compound is removed, and since it becomes more difficult to remove with delay, all sheets are put through this cleaning operation before storing.

Sheets Annealed and Pickled

Following cleaning, the sheets are annealed and then pickled in an acid solution. The next step is a rinse in clean running water for the purpose of removing the scale. A rinse in clean boiling water comes next and the final step is a thorough drying, keeping the sheets clean for welding operations to follow.

Simply stated, an evaporator consists of two sheets provided with corrugations and headers. The sheets are properly matched, welded together and formed U-shape, as shown in Figs. 1 and 5. The only forming operation on the inside sheet, shown in Fig. 2, is for the two headers and for a small channel to serve as the liquid inlet. Each header has a hole punched in it to accommodate insertion of an equalizer tube. Four square holes are punched for the bolts which will support the finished evaporator on the monitor top. Two small round holes are punched in this sheet to serve as locating holes in subsequent fabrication and matching operations.

The outside sheet, shown in Fig. 3, is slightly narrower and somewhat shorter than the inside sheet and is formed not only with the two headers but with a series of nine corrugations which connect the headers and provide passages for the refrigerant to flow from one header to the other. The two rows of enlargements are provided in the corrugations to prevent them from closing up when the sheet is given two 90-degree bends in a subsequent forming operation. One header has two holes punched in it, one to provide for insertion of the inlet tube and the other for the suction tube.

At this point, the inner and outer

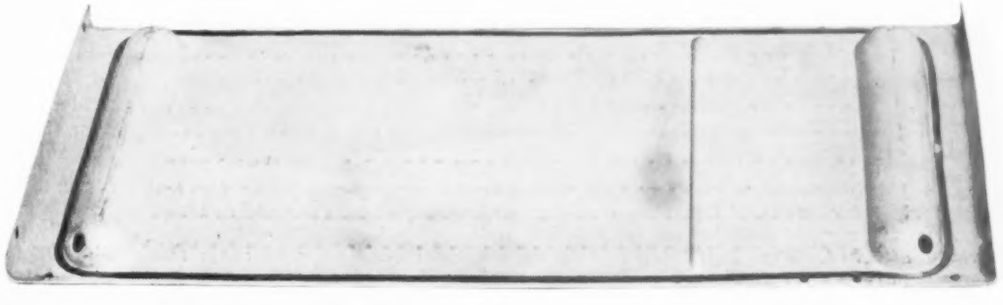


FIG. 4—After trimming, the inside and outside sheets are matched and spot welded every ¾-inch between corrugations. A seam weld then is run completely around the outside

sheets are trimmed to size, are matched accurately in a jig and spot welded approximately ¾-inch between the corrugations. An electric line or seam weld is run completely around the outside of the headers and corrugations, thus providing a complete seal. The spot and seam welds can be seen in Fig. 4. This assembly is placed in a press and the longitudinal edges of the inner sheet are wrapped 180 degrees around the edges of the outer sheet to obtain a rounded finished edge. Passing to another press, the two ends are turned 90 degrees, also as shown in Fig. 4, to provide the supporting flanges. In the final forming operation, the assembly has its ends turned 90 degrees to provide the U-shaped unit shown in Fig. 5.

Connections Are Silver Soldered

The two-headers are connected with a ½-inch diameter copper tube, the purpose of which is to equalize the pressure in opposite sides of the evaporator. This is shown in Fig. 1, an evaporator as viewed from the rear. Another copper tube is attached to the outside front end of the left header to serve as the refrigerant inlet, while still another tube is attached to the outer top side of the same header to serve as the refrigerant suction tube. These copper tubes are attached to the stainless steel by silver soldering.

The shelf shown in the evaporator in Fig. 1 is an extruded aluminum section which carries two ice cube trays. It is supported in position on eight 18-8 steel thimbles, four on each side, inserted in the shelf bracket holes and spot welded to the evaporator walls. After welding is complete, the open ends of the thimbles are closed or sealed by pressing aluminum buttons into them.

Evaporator units thus fabricated are submitted to a submergence test under water; one copper tube is sealed while air at a pressure of 90 pounds per square inch is applied through the other. Leaks, should there be any, are detected at once by escaping bubbles of air. Passing this submergence test, the open copper tubing is sealed and the units are first cleaned free from oil, grease and dirt, then pickled to remove the slight discolorations caused by welding. All cleaning and pickling equipment is conveyorized. The evaporators pass into the alkaline cleaning solution which is maintained at a boiling temperature and remain immersed from 5 to 15 minutes. They are then rinsed in clean running water and pickled. After drying, the units are transferred to the assembly department.

As mentioned previously, two types of monitor-top evaporators are made in the Schenectady plant; one is provided with the aluminum shelf as just described, and the other, somewhat smaller, has no shelf.

Evaporators for the small lift-top refrigerator are distinctly different from those for monitor-top refrigerators. The lift-top model provides storage space of only 2 cubic feet, as compared with 5 cubic feet and upward for monitor-top models, therefore the evaporator has much smaller capacity. The lift-top evaporator or freezing plate is made in the form of a shelf and supporting back, as shown in Fig. 6, and is attached to the back wall of the storage compartment. Two ice cube trays rest on the shelf. Made of stainless steel, the freezing plate is provided with a series of corrugations through which the refrigerant circulates. The freezing plate is constructed by forming two 18-8 sheets, a top sheet and a bottom sheet, matching them together and then welding them into one unit. This assembly then is folded 90 degrees to form the shelf and back.

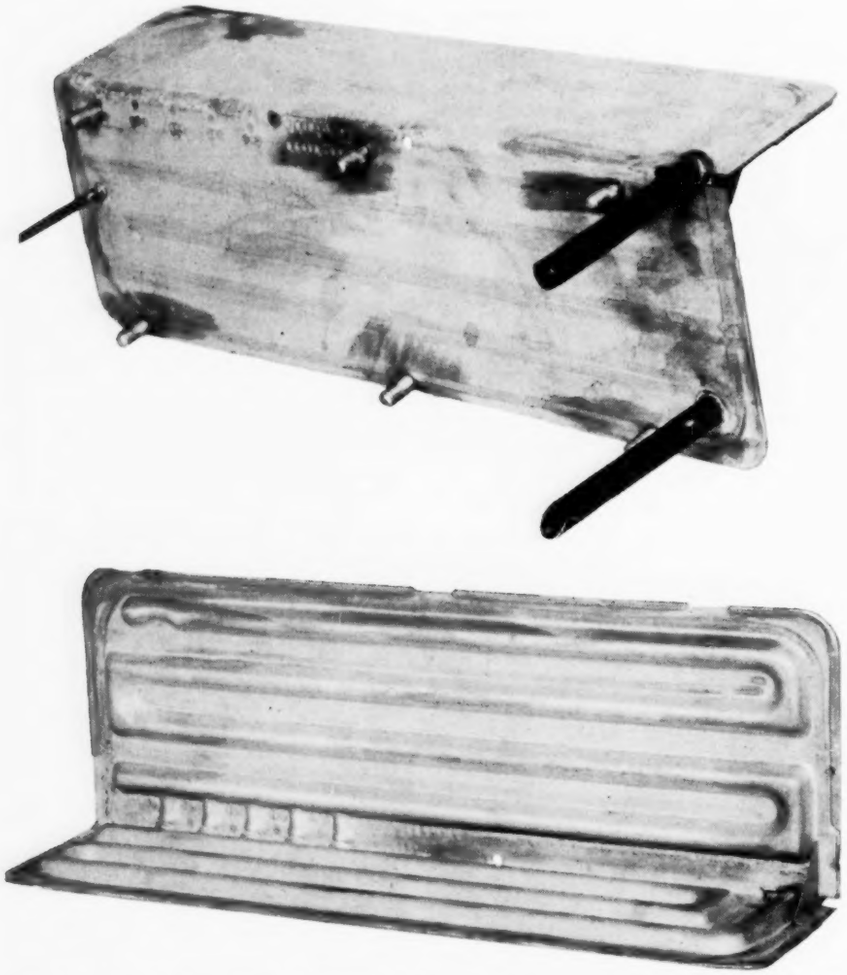


Fig. 6 (Top)—Completed stainless steel evaporator or freezing plate for lift top refrigerator. It is in the form of a shelf and supporting back and is shown here in its normal position of installation with mounting studs and copper tubing attached. Fig. 7 (Bottom)—The evaporator turned over to show the formed passages for refrigerant. Both illustrations show spot and seam welds

Units Spot and Seam Welded

Forming and punching of the top sheet is performed as shown in Fig. 9; forming of the bottom sheet is somewhat more complicated, as shown in Fig. 10. The latter has two series of corrugations, ½-inch wide and 5/16-inch deep, which are joined by five transverse connectors. After being formed, annealed and pickled, the two sheets are assembled in a jig for perfect matching and are spot welded together between the connecting corrugations. Removed from the jig, the assembly is seam welded between all the corrugations, also seam welded completely around the outside edge to seal in the corrugations completely.

At this point, the assembly is placed in a press and the top sheet, which is slightly larger than the bottom sheet, has its outside edges folded 180 degrees around the bottom sheet to provide a rounded edge. Six solid 5/16-inch 18-8 steel studs, threaded to receive nuts, are projection welded to the back side of the assembly to serve as a means for installing the freezing plate in the storage compartment of the refriger-

Fig. 8—The spherical header is fabricated by forming two stainless steel half spheres and seam welding them together. Copper tubes are silver soldered into the lower half as shown

ator. The next step is to place the assembly in a press and to fold it 90 degrees, as shown in Figs. 6 and 7, so that it takes the form of a shelf and bracket. The unit is given greater rigidity by spot welding two 18-8 reinforcing angles into the 90-degree angle at the two ends.

Given Submergence Test

Three copper refrigerant inlet and outlet tubes are silver soldered to the back side of the freezing plate, these tubes to project through the back of the refrigerator cabinet and to be connected to a spherical header mounted on the rear side of the cabinet. The soldering operation completed, two of the tubes are sealed, air pressure is introduced into the third, and the evaporator is given a water submergence test for leaks. Passing this test, the evaporator is routed to the cleaning and pickling baths, rinsed and dried and transported to the assembly department.

The spherical header just mentioned also is fabricated from 18-8 steel. It is 3½ inches in diameter and is made by forming two flanged half spheres. It has two copper tubes silver soldered into the lower half. The two half spheres are joined by running a seam weld around the match flanges as shown in Fig. 8.

Much of the success which the General Electric Co. has attained in the fabrication of 18-8 steel is attributed to the method of welding. Because of its wide eutectic range, as compared with ordinary steel, 18-8 will burn more easily and become embrittled when overheated, thus it is necessary to control the period of time during which current passes through the metal in making a weld. All of the spot and seam welding machines employed in evaporator welding are controlled by thyratron tubes, a General Electric development. High speed without sacrifice of quality or reliability is attributed to the accuracy with which the thyratron control operates.

In its essentials, thyratron control acts as a switch which gives accurate weld timing. In spot welds as well as in seam welds, any desired number of cycles of current may be utilized, the number being determined by the thickness of the material, weld area and other factors. A good seam weld requires from 12 to 15 overlapping spot welds per inch; the larger the number of welds, the better the weld appearance, likewise the better the adjacent material. As a rule, seam welds range between 1/4 and 5/16-inch wide.

In the case of 18-8 steel, a weld of short duration prevents carbide precipitation which causes embrittlement and corrosion of the weld and areas adjacent to it. Thyratron control produces accurate and consistent results in both spot and seam welding, for it not only gives accurate control of the cycles of current used, but it selects the proper part of the sine wave. It can be pointed out that the part of the wave used has an important bearing on the consistent operation of a welding machine and the quality of the welds produced.

Requisites for Good Welds

Spot welds in the fabrication of the 18-8 evaporators use 2 cycles of current; seam welds are made with 2 cycles on and 2 cycles off. All current is 60-cycle. According to General Electric welding experts, thyratron control will not correct all the ills of welding, for other factors enter into the problem. Material to be welded must be kept clean and the parts should come together closely without the necessity of the electrodes' forcing them together. Elec-

Fig. 9 (Top)—The lift top refrigerator evaporator also is made of two 18-8 stainless steel sheets, a top sheet and a bottom sheet, which are formed, trimmed, matched and welded together. The top sheet, shown here, is given a small amount of forming and punching. Fig. 10 (Bottom)—The bottom sheet is formed with corrugations and connectors which constitute refrigerant passages

trodes must be maintained in good condition; any mushrooming of the contact points increases the contact area, thereby decreasing the current density and affecting the quality of the weld.

Electrode tips are of elkonite, a sintered tungsten-copper alloy which has good electrical properties and shows satisfactory service life. More recently, silver elkonite has been used to good advantage; this is a tungsten-silver alloy which possesses a lower surface contact resistance. Wheels for seam welding machines are made of elkaloy, also a copper alloy composition. Electrode points and wheels must be kept cool for best results, therefore, the tips are internally water-cooled and the wheels are externally cooled by water streams.

Welding machines equipped with thyratron control have individual control units housed in cabinets which in most cases are located remotely from the machines. These controls maintain their adjustment when once set and the cabinets are kept locked so that the operators cannot alter the timing. One electrician has charge of all thyratron controls and he is the only one permitted to make adjustments. He makes regular inspections of the units to see that they are operating properly and he supervises repairs when necessity requires. This is one guarantee of weld quality and uniformity. As an additional guarantee, another man is employed to keep a constant watch over the condition of material sent to machines for welding and the condition of electrode tips and wheels. In this way, conditions are under control so that only clean surfaced 18-8 reaches the welding machines and electrodes are in first-class condition for making sound welds.

Faster Welding Is Expected

The spot and seam welding machines in the Schenectady plant have produced as many as 6,000,000 spot welds and 1,500,000 inches of seam welding on evaporator units without a rejection because of faulty welds. The monitor-top type evaporator requires 310 spot welds and 75 inches of seam welding. The spot welding is performed at a rate of 150 welds per minute and seam welding at a rate of 72 inches per minute. It is expected, however, that even these high speeds will be increased—seam welding to approximately 100 inches per minute and spot welding to a correspondingly higher rate.

Another advantage of thyratron control welding is its use for very thin sections in which case overheating is particularly detrimental. The thinnest high-tensile strength, cold-rolled 18-8 steel so far welded was 0.004-inch thick, but General Electric engineers see no reason why thinner material cannot be welded with acceptable results. Welds as short as ½ cycle prove satisfactory for the thinner sections. Fig. 11 shows at 50 diameters a spot weld made between two pieces of 0.037-inch 18-8; this weld was made in 0.0222-second, using 1.7 volts and 19,500 amperes. A section of this weld which looked like a crack was magnified 1200 diameters, as shown in Fig. 12, and revealed an irregular crystalline boundary which was proof of a good weld.

In connection with the proof testing of welds, company engineers have made line weld specimens in 18-8, which when tested hydrostatically have withstood 3000 pounds per square inch without failure.

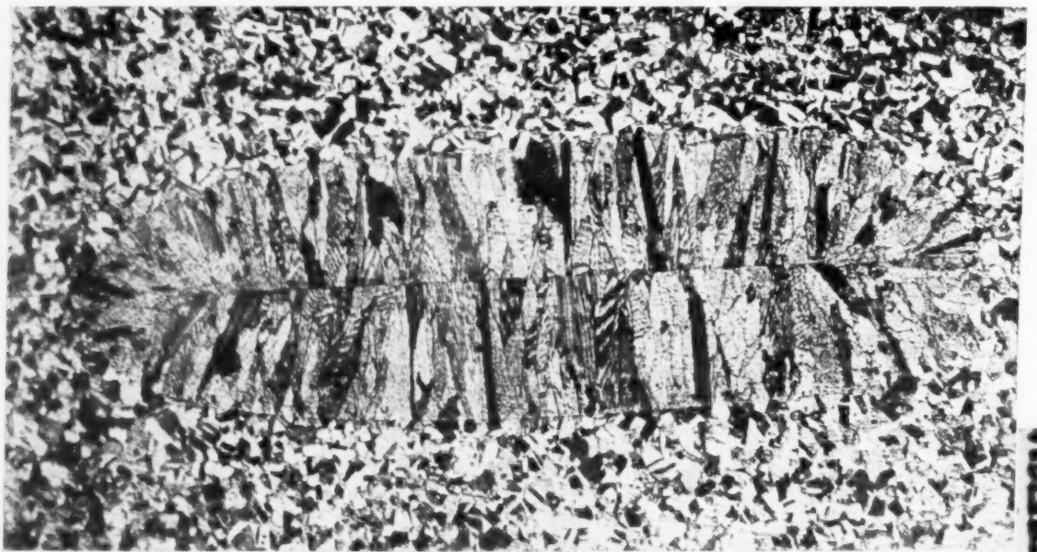


FIG. 11 — A 50-diameter enlargement of the cross-section of a weld made between two pieces of 0.037-inch thick 18-8 stainless steel. Weld made in 0.0222 seconds, using 1.7 volts and 19,500 amperes

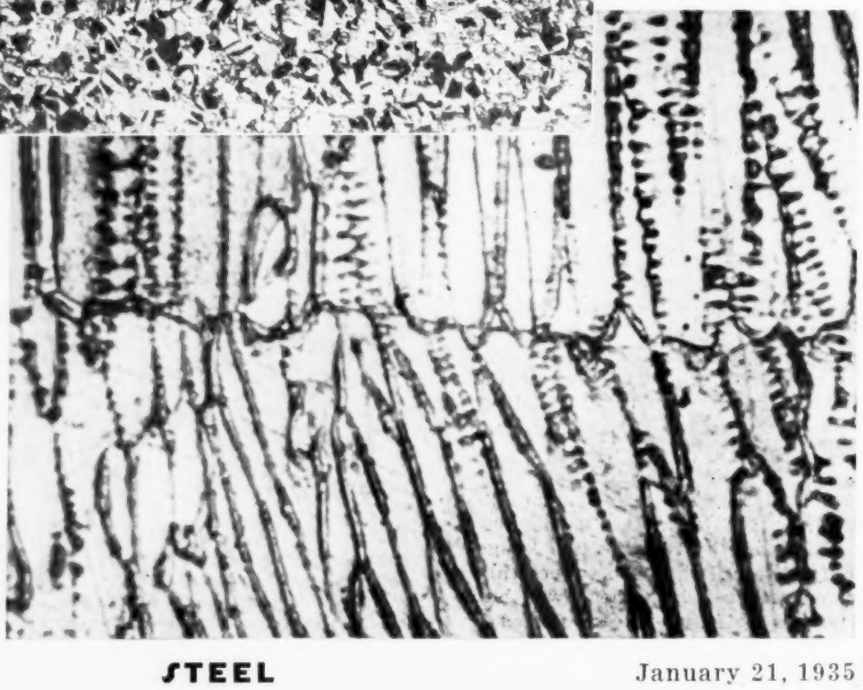


FIG. 12—A section of the weld shown in Fig. 11 which had the appearance of a crack was magnified 1200 diameters. The photomicrograph showed an irregular crystalline boundary which was proof that a good weld had been made

Engineering Aspect Of High-Strength Sheet Steels

BY V. H. LAWRENCE

Metallurgical Engineer, Alan Wood Steel Co., Conshohocken, Pa.

INTEREST in high-strength sheet steel, enlivened during 1934, first by the wide publicity given the railway equipment featuring light weight design and high strength materials; and then fostered by the development and sale of commercial high-strength steels by at least three producers, has led the writer during the last few months to visit a number of engineers, fabricators and manufacturers to ascertain as accurately as possible the future of high-strength sheet steels, the manufacturing limitations of these steels and primarily the engineers' viewpoints as to the value of high-strength sheets.

What follows is largely a summary of the points discussed, arranged in sequence as related to definite engineering factors, and represents the pertinent points the engineers, fabricators and manufacturers either by experience, hearsay and/or lack of sales resistance have determined, anticipate or fear through the growing use of high-strength steels.

Criticism Not Intended

Because any comments which are not wholly favorable or enthusiastic might be construed as unfair criticism of a new product whose manufacture so far has been limited to a relatively few producers of steel, the writer wishes to go on record as being associated with a producer who has for some years and is now producing high-strength sheet steels, and his personal opinion is that there is a broad engineering field for such a product.

As a question of economics, the use of strong, light weight material is desirable from the standpoint of conservation of raw materials suitable for the production of ferrous materials. Furthermore, in the case of rolling stock, the further conservation of fuel justifies taking full advantage of the maximum safe strength possibilities.

On the other hand, ill-considered applications leading to whole or partial failure, will discourage not only those immediately connected with the failure, but a similar group who through hearsay may know of the failure without appreciating the reason therefor.

Too Much Weight Used

One of the bright spots favoring the more extended applications of high-strength sheets is the fact that many existing applications of sheet steel are unnecessarily heavy and could be reduced in thickness and weight successfully with standard materials. Attention focused on weight reduction undoubtedly will result in high-strength sheet steels being used on such applications and being credited with the advantages accrued.

The anticipated setback from the growth in popularity of high-strength steels will be the tendency to base applications on unit stress alone, without regard or with insufficient regard to the other features involved. To bring these points to the prospective redesigners attention, the writer is listing those features involved:

1. Establishment of a safe unit fiber stress which is affected by:
   (a) Tension properties; particularly the location of the elastic limit or yield point or proportional limit.
   (b) Corrosion resistance and its effect on the unit area (and inversely on fiber stress) after service.
   (c) Rigidity; and it is to be noted that no type of steel or method of treatment affects the stiffness, i.e. M = modulus of elasticity which remains 29,000,000 to 30,000,000 regardless.
   (d) Fabricating effect on static and dynamic properties; i.e., the favorable or detrimental effect of cold bending, punching or welding on the tension or impact properties of the steel.
   (e) Fatigue properties and relation of live to dead loads.
2. Determining these engineering features not calculable by formulas, including:
   (a) Desirable factors of safety in relation to importance of the member.
   (b) The protection offered over service life by painting, coating and inspection.
   (c) The necessity of rigidity in excess of that required for strength or deflection as a psychological factor in service.
   (d) The relation of thickness and rigidity to objectionable phonetics, i.e., the increased tendency towards echoes, drumming, etc., due to light wall thickness insufficiently supported.

Working Load vs. Static Strength

Considering these items in detail and their inter-relation, the ratio of safe working load to static tension properties should be considered. On commercial hot-rolled structural steel such as is covered by A.S.T.M. specifications A7 or A9. federal specifications QQS-711 or QQS-721, A.A.S.M. Class A etc., the following relations exist between static physical properties:

Yield point (elastic limit) = ⅓ tensile strength.
Elongation in 8 inches (ductility) = 1,500,000/tensile strength.
Safe working load = ¼ tensile strength or ½ yield strength.

For years, basing experience on steels of the same general characteristics, the safe working load was assumed as approximately one-fourth the maximum ultimate strength until it was pointed out that the safe working load had no real relation to the ultimate strength, but should be considered more accurately as one-half the yield strength which on these steels, gave the same values. The reasoning is so obviously correct, based on the knowledge that any load exceeding the yield strength and thereby introducing permanent set constitutes failure of the part and throws the load on adjacent parts,

that the full realization of strength value of high-strength steels, on which the structural relationship varies from standard steels, demands the acceptance of this method of arriving at safe working loads by a system providing metallurgical accuracy.

As a comparison, the tension properties of the three better known high-strength steels are:

Yield point, lbs./sq. in.

A	*B*	*C*
50-60,000	70,000 Min.	70-85,000

Tensile strength, lbs./sq. in.

A	*B*	*C*
65-75,000	90,000 Min.	90-105,000

Elongation in 2 inches

A	*B*	*C*
27/22%	20% Min.	20-26%

Elongation in 8 inches

A	*B*	*C*
.....	.....	1,500,000/T. S.

Using high-strength steels *B* and *C* as examples: If the safe working load is assumed as one-fourth the maximum ultimate strength or approximately 26,000 pounds per square inch, an increased strength of about 60 per cent or a decreased area of 37 per cent can be considered.

Gives Designing Advantage

If, however, a safe working load of one-half the yield strength is assumed, or 35,000 pounds per square inch, a designing advantage of 235 per cent over structural steel is permitted. This use of a 35,000-pound fiber stress still permits as a factor of safety 35,000 pounds per square inch before permanent set, as compared with 14,000 pounds per square inch in the case of A.S.T.M. specification A7 where a fiber stress of 16,000 pounds is used in conjunction with a yield strength of 30,000 pounds per square inch.

As an example: Using a section ⅛ x 1-inch instead of a ¼ x 1-inch structural steel, the safe working load would be:

	Steels *B* and *C* ⅛ x 1″	A.S.T.M. A7 ¼ x 1″
Safe working load, lbs.	4375	4000
Failure due to permanent set would occur at, pounds	8750	7500

If, however, corrosion rates were the same in both of the above steels, and corrosion with resultant reduction in cross-sectional area becomes a factor of strength, then the point at which the cross-sectional area had been reduced to the extent where the full yield strength existed in the structure, would be arrived at sooner in the light section high-strength steels.

When increased tension properties permit a decrease in thickness of 40 per cent, or from ¼-inch to 10-gage or from 3/16-inch to 12-gage, an increase in resistance to corrosion and/or abrasion of at least 66 2/3 per cent is essential to insure the same life in service.

Corrosion resistance scarcely can be predicted, and obviously to hold up a new steel for 5 to 10 years to permit predictions on the basis of service tests is uneconomical, so that producers of high-strength corrosion-resisting sheets are basing predictions of corrosion resistance on accelerated corrosion tests, the results of which may or may not be synonymous with service life. Corrosion resistance under a multiplicity of varying conditions is at best hardly a factor which can be converted into engineering terms, and yet is probably the most important factor in the use of high-strength steels on which the purchaser must design and buy on faith in the producer.

Due to the inability of any chemical, thermal or mechanical treatment to change the modulus of elasticity, intelligent redesign must take into account the necessity of maintaining the same moment of inertia in the redesigned section through the use of ribs, beads, corrugations and the like.

Intimately connected with the redesign for rigidity is the ability of the steel under consideration to be fabricated to the new design on existing or available equipment, without serious disturbance of the physical properties by such fabrication. Some steels cold work harden readily, and the work hardened area may increase in strength with a greater increase in brittleness to the point of susceptibility to service failure due to shock or fatigue, where it is to be noted that stress concentrations due to design often fall at areas which are subject to work hardening. Other steels are affected radically by hot working, particularly those in which properties are obtained by previous treatment.

Restrictions of Welding

Welding as a means of fabrication is so common that its effect on the finished structure must be considered, not only where it is contemplated as a part of the original fabrication procedure, but with the possibility that it might be used as correction in case of fabricating failures or in service repairs later. Successful fusion welding of sheet steel involves greater restrictions on the parent metal than are required for acceptable welds on structural members or heavier flat-rolled sections. This is due, in part, to the fact that sheet steels are readily adaptable to automatic welding where no allowances can be made for metal defects; to the necessity on light material of producing not only a sound, strong weld but a smooth appearing weld as well; and to the air hardening possibilities of thin sections where the air quenching effect is more pronounced and no self-annealing is met.

For fusion welding heavy sections, plates and the like, the following maximum limits in chemical composition generally are adopted:

	Per cent
Carbon	0.31
Manganese	0.75
Silicon	0.25
Sulphur	0.05

The relation of welding to corrosion resistance also must be considered. Is a welding rod (if used) available which will result in welds of equal corrosion resistance in the deposited metal, or can a bead of sufficient area and density be produced to permit the use of ordinary rod? Is there a possibility of electrolysis between parent metal and deposited metal due to differences in potential developed by different chemical compositions? Laboratory tests or accelerated corrosion tests again must be relied upon for answers to these possibilities.

The most important feature in welded construction—the effect of the weld on adjacent parent metal—requires some consideration of the methods of production of high-strength steels, and the writer will digress for a moment to consider the means by which high unit strengths are obtained.

Three Controlling Factors

High unit strength in any of the ferrous material is a function of one or more of the following factors: (a) Chemistry; (b) heat treatment; and (c) mechanical treatment. The advantages and disadvantages of each method of producing high-strength steel are summarized in order.

(a)—Chemical composition

The strength (static tension) may be increased above that of pure iron (40,000 pounds per square inch) by the addition of hardening elements—carbon, manganese, silicon, chromium, nickel, molybdenum and vanadium being the most common. Carbon will increase the ultimate strength to the extent of about 1000 pounds per point (0.01 per cent) and the elastic limit (yield point) about 600 pounds per point; manganese at the rate of 100 pounds per point in ultimate strength and 60 pounds in elastic, with the other elements in decreasing value.

The simplest method of producing high-strength sheet steel is to combine the above hardening elements to produce the desired ultimate strength, hot roll the material and normalize or anneal. To produce material of extremely high elastic limit (at least twice the the safe working load) requires, therefore, an extremely high ultimate strength with correspondingly low ductility. The

major objection to this type of steel is brittleness adjacent to a weld, because the high concentration of hardening elements air quenches to extreme brittleness from welding temperatures.

(b)—Heat Treatment

The same values in ultimate strength, higher values in elastic strength and therefore higher safe working loads can be obtained by quenching and tempering steels much lower in alloy or carbon concentration. Better ductility and higher fatigue values are exhibited by the quench and draw treatment. Objections involve high cost and the inability to obtain a reasonably flat finished sheet.

(c)—Mechanical treatment

The high ratio of elastic limit to ultimate strength in existing high-strength steels indicates the existence of internal stress, probably set up by some degree of cold work or subcritical rolling followed by partial stress relieving. Where the relation of cold work to base metal chemistry can be controlled, so that the annealing effect of weld temperatures balances the air-quenching effect inherent in the chemical composition, a high degree of weld strength is to be anticipated.

Of the engineering features not calculated by formula, two points warrant repetition for emphasis. The psychological requirement of rigidity often in excess of that required for strength is important. The mental insecurity of the individual who is in contact wtih a structure of considerable resiliency, even though excessively strong, may lead to a considerable reluctance toward further utilization of such a structure.

Secondly, noise, drumming and echoing due to decrease of metal thickness over large unsupported areas may be anticipated in some instances and is generally objectionable. The use of silencers in conjunction with reduced thickness of steel often may overbalance the increased saving in weight or cost anticipated.

The ultimate decision as to the use of light weight, high-strength steels and the selection of the particular type of steel for the purpose can be made more intelligently by considering which points are important and then verifying them either personally or by reliance on responsible authorities. Summarizing these features and where and how they may be verified:

1.—*By the engineer*

(a) Can the design be modified to permit substantial saving in weight or cost or additional factors of safety?

(b) Will reduction in metal thickness conflict with any existing insurance or inspection standards, and if so are the advantages to be accrued sufficient to justify an attempt to have these limits modified?

(c) Can the information in following sections 2, 3 and 4 be obtained and relied upon?

2.—*By the buyer's laboratory*

(a) Are the physical properties uniform and within reasonable relation to those anticipated or guaranteed?

(b) Does the chemical composition conform to that on which corrosion predictions have been made?

(c) Do shop welds exhibit sufficient strength to permit their use in design?

(d) Are shop welds sufficiently dense (free from porosity) to permit comparison with weld corrosion predictions?

(e) Are the physical properties adversely affected by anticipated methods of fabrication —cold work, hot work, punching or welding?

3.—*By the buyer's shop*

(a) Is the finish available suitable for the part?

(b) Is the flatness available suitable for the part?

(c) Can the material be processed with existing equipment or will new, stronger equipment be required in addition to that required by redesign?

(d) Can the new material be welded with available facilities to produce a smooth workmanlike weld?

4.—*By the producer*

(a) What is the corrosion resistance of the metal as furnished?

(b) Will the corrosion resistance of the metal be changed by anticipated methods of fabrication, service or repair?

5.—*By the buyer*

(a) Is the new material available at a satisfactory price and within reasonable delivery periods?

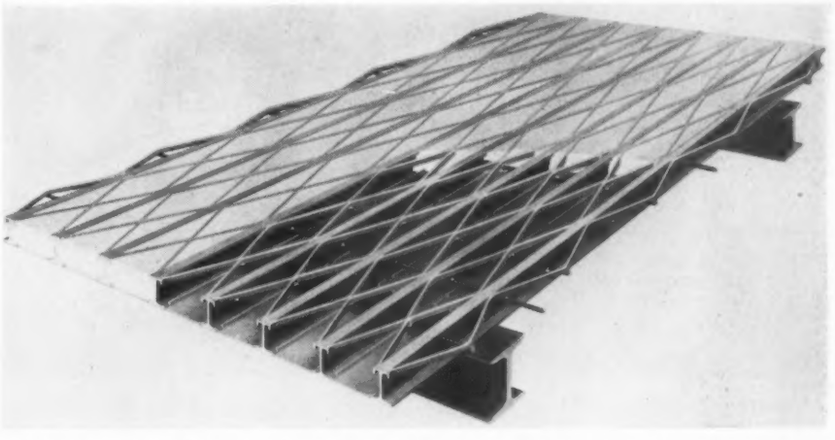
(b) Are the necessary complements for construction—bolts, rivets, welding rods, etc.—available at reasonable price and within reasonable delivery periods?

(c) Will the advantages accrued by the change in design, through saving in net costs, saving in service cost, saving in weight and advertising value offset the cost of redesign, cost of development and production, as well as hazard of service?

Polishing Grain Is Etched

A new polishing grain developed by the General Abrasive Co., Niagara Falls, N. Y., is said to have greater surface adhesion and to cut more keenly, with resulting lower polishing costs, for the reason that the grain is treated with an etching process that eats into the grain and develops small pores. Other features claimed for this polishing grain, known as CBT Lionite, are polyhedral shape, proper temper, high capillarity, accurate grading and average of more than 95 per cent alumina.

Nonskid Bridge Flooring



FLOORING COMBINES STRENGTH, LIGHT WEIGHT: Recently introduced for bridge floors and other heavy-duty applications by the Truscon Steel Co., Youngstown, O., this "I-grid" flooring embodies uniformly spaced I-beams connected by a grid of reinforcing straps welded in position. Into this framework concrete is poured as shown, leaving exposed the top flanges of the beams and edges of the diagonal members. This provides good traction for tires, even in wet weather, and protects the concrete from excessive traffic wear. Steel members are supplied to the job in such form that field welding may be accomplished easily and quickly. All benefits of reinforced concrete surfaces, together with light weight, are claimed for the new design

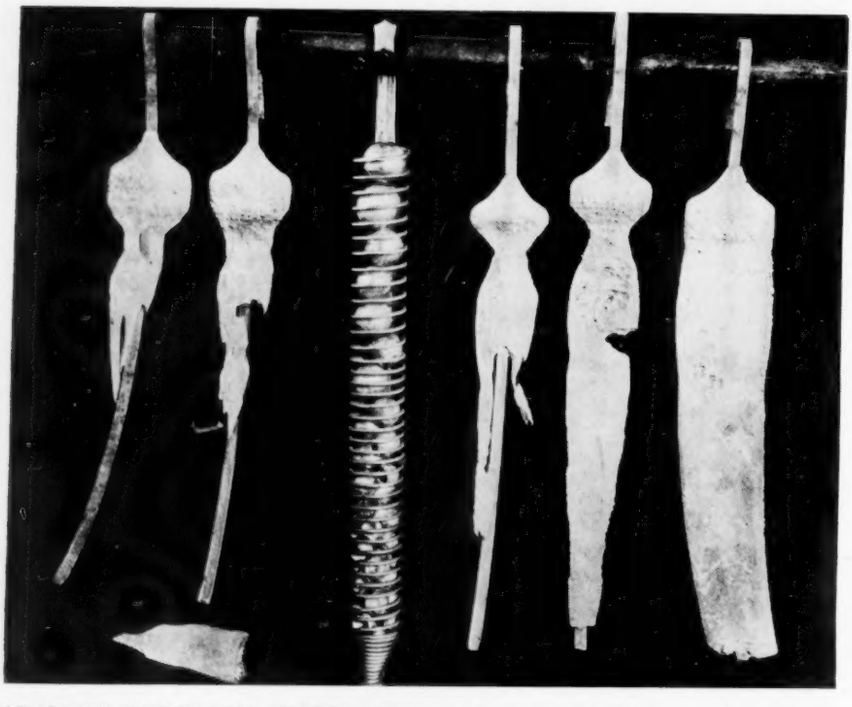
Ship Mooring Line Employs Both Steel and Manila

A new type of mooring line developed recently embodies features of steel lines with none of the disadvantages of steel cable. This line, made up of plow steel and manila rope braided together, permits the use of a line having a smaller diameter than a line made up of manila only. Due to the presence of the manila rope, this mooring line will not kink in the manner usual with this type of cable. It outlasts both all-cable and all-manila lines of similar dimensions.

Its strength is attested to by the story of the American ship which experienced considerable trouble with towboats in one of the largest European ports. Every time a line was passed to the towboat it was broken, due to the incompetence of the towboat captain. On a recent voyage the ship passed over a line made up of the steel and manila. The towboat captain tried his usual tactics with the result he almost turned the towboat turtle.

s s s

Boon to Platers



GRANTED PATENT ON ANODES: Ball anodes for electroplating and containers for them, claimed to have been first used as part of a process for cadmium plating several years ago by the Udylite Co., Detroit, are covered in U. S. Patent Reissue 19328 recently granted to the Udylite Co., which now has exclusive rights to manufacture, sell and use ball and spheroidal anodes for electroplating. An important feature of this type of anode is the maintenance of constant anode area at all times, making it possible to keep the metal content of the plating bath constant without salt additions. Another feature is the elimination of scrap metal loss, since as the ball anodes dissolve, they diminish in diameter and descend in the container. Fresh balls are added at the top. The illustration shows a comparison of the ball anodes with the usual type of slab anode in various stages of disintegration

Reclaims Abrasion Worn Dredge Pump Impeller

Arc welding was used recently to recondition the impeller of a 12-inch dredge pump, the blades of which had worn down on the edge approximately 2¼ inches due to sand and abrasion. The impeller weighed 400 pounds, had a diameter of 26 inches and a width of 12½ inches; the blades were 1¼ inches thick. Repair was effected by cutting spring steel blades from 5/16-inch material and fitting them into the worn places on the edges of the blades. These pieces were welded into the manganese blades with a stainless steel welding rod. The next step was to build up the blades with manganese rod to the original thickness of 1¼ inches. After the job was completed, a 22-pound sledge hammer was used to test the welds and the work stood up under this impact without any signs of breakage or disturbance.

s s s

Molybdenum Assists Local Hardening of Steel

According to a recent patent, local hardening of steel may be accomplished easily if the steel contains from 0.2 to 0.5 per cent molybdenum. The piece is immersed in water up to the desired hardening depth

and heated with a gas torch to 1250 to 1700 degrees Fahr. The length of time heat is applied determines the depth of hardening. Then the piece is quenched in water. Hardness of 90 to 100 scleroscope is claimed with a thin sharp line of demarcation between the hardened and unhardened portions.

S S S

Grinds Blades which Trim Type Metal Line Slugs

Steel knife blades, used in trimming slugs in line type composing machines, are ground on two sides and at two angles by an eastern manufacturer of this equipment. The work is done on an openside type of grinder, the blades being mounted several at a time on a special fixture, each at the same side and angle. The roughing and finishing is done in one operation with about 0.010-inch of stock removed. A 60-grit, combination A, grade I, aluminum oxide wheel is used. The wheel is 10 x 3 x 3 inches, and rotates at 1000 revolutions per minute, with the work moving back and forth before the wheel at a speed of 60 feet per minute.

S S S

Aluminum Paint Flexible And Corrosion Resistant

Flexible aluminum paint which gives a scale-like metal sheathing for longer protection, plus a smooth, brilliant finish, has been perfected by an eastern lacquer manufacturer. Dirt and dust do not attach themselves readily to the surface of the paint. Because of water resisting qualities, including salt water, the surface can be washed frequently without damage. The paint also displays resistance to chemical fumes, humid atmospheres, corrosion, rust and decay, and similar destructive forces.

S S S

No Cutting Oil Stains

Discoloration from cutting oils cannot be detected on a new tapping machine recently placed on the market. This machine is of a chocolate brown color with a crystalline finish which absorbs or hides the glossy appearance of the oil.

S S S

"Start at This End" is the wording on a tag which a large wire manufacturer puts on wire coils before shipping them to customers. The tag is attached to the "starting end" of the wire, and is provided to speed up handling of the wire by the purchaser.

Thawing Frozen Water Pipes by Heating With Arc Welding Generators

BY S. C. OSBORNE, Chief Engineer,
Wilson Welder & Metals Co. Inc., North Bergen, N. J.

AN ARC welding generator is very well suited for use in thawing frozen water pipes and quite a few generators have been bought for this use during the past two years. All that is necessary is to connect the terminals of the welding generator, through suitable cables, to opposite ends of the section of pipe which is frozen so that current is thus made to flow through the pipe. Heat generated in the pipe by the current flowing through it is sufficient to melt the ice quite rapidly and since the heat is actually generated in the pipe itself, this method of thawing is most economical.

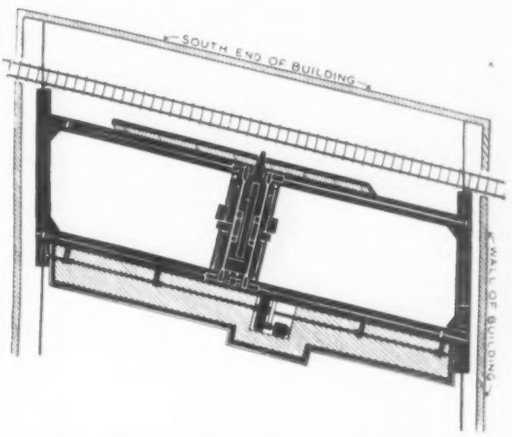
A number of cautions must be observed while using a welder for this purpose. It is essential that the current capacity of the machine never be exceeded, if it is necessary to run the machine for any extended period of time. If the pipe can be thawed in one hour, the current can be brought up to the full 1-hour rating of the machine. If the pipe can be thawed in 15 minutes to ½-hour, the machine may be used at full capacity, provided it is allowed to cool for a while after one section has been thawed before attempting to thaw another.

It is always advisable to take a long enough section of pipe so that the terminal voltage of the machine is approximately at its rating; in other words, when using a 25-volt machine, take a long enough section of pipe so that the voltmeter of the machine shows 25 volts, and if the machine is a 40-volt machine so that the voltmeter shows 40 volts. The object is merely to operate the machine at its maximum efficiency. In any case, the machine should never be operated at a terminal voltage above its rating.

Determining Current Needed

It is difficult to specify what current value should be used for the various sizes of pipe because of joints in the pipes, the presence of insulation or lack of insulation, the position of the pipe—whether below ground, in a wall or concrete floor, or out in the open air. All of these factors affect the heat loss from the outside of the pipe and thus the amount of heat required to melt the ice in the pipe. However, the accompanying table may be used as a guide. It is compiled on the assumption that the pipe has been frozen solid, that it is in free air and that approximately half of the heat is lost from the outside of the pipe to the air. The current values given should be sufficient to melt the ice completely in one hour. Thus, if the pipe is small, increasing the current will shorten the time. If the current is doubled, the ice should be melted in half an hour. However, it is recommended

Crane Goes Askew



INSTALLS SKEW CRANE: Because of the peculiar shape of the south end of this building, plant 37 of the Fisher Body Corp. at Detroit, this crane has been built so that it travels askew on its runway at an angle of 77 degrees, matching the angle of the south wall which in turn was built parallel to the railroad siding. Thus the crane is able to load and unload materials from cars throughout the building, handling dies, presses, sheet stock and the like. The crane, a 50-ton unit, has a span of 67 feet. Trolley is the low overhead or submerged type with most of the mechanism suspended between the crane girders, headroom being only 7 feet. The unit was built by Harnischfeger Corp., Milwaukee

Current Required To Melt Ice in Pipe in One Hour

Standard weight iron pipe sizes in inches	Amperes		
	Iron or Steel pipe	Brass pipe	Copper pipe
½	30	45	80
¾	45	65	100
1	60	85	150
1¼	80	100	200
1½	125	150	300
2	170	200	350

that the current values used never be greater than four times those given in the table because of the danger of damaging fittings and joints in the pipe. The resistance of the joints may be considerably higher than the resistance of the pipe, therefore a much greater heating effect is developed in the joints, and since there is danger of their becoming extremely hot they may cause a fire hazard. In order to overcome this high resistance in the joints to prevent a fire hazard, and to increase the efficiency of the operation, it is suggested that a heavy copper strap or a short piece of heavy cable be connected across each high resistance joint. This is absolutely essential where leaded joints or joints packed with nonmetallic packing are encountered. It must further be noted that this table is worked out for standard weight iron pipe sizes.

In private dwellings or other buildings wired for electricity, it is absolutely essential that all ground wires be disconnected from the water pipes before attempting to thaw them by electricity, since the currents used in thawing the pipes are considerably heavier than the electrical wiring in the building was meant to carry. Failure to disconnect the ground wires may cause a serious fire hazard.

It is also suggested that the service pipe at the entrance in the basement be disconnected so that there is no danger of circulating current outside of the building, which might cause damage in the wiring of adjacent buildings or to leaded joints in the service connections.

It is to be understood that if the pipe to be thawed is exposed to very low temperature, such as on the outside of a building, in frozen ground or under freezing water, higher current values must be used. Thus it can be seen that a great deal of "cutting and trying" is necessary satisfactorily to thaw frozen pipes under all conditions. However, a number of years of experience has shown that an arc welder generator is a most suitable source of power for this work.

Tubular Steel Scaffold Used on Washington Monument Repair Job

IN RECENT months much publicity has been given to the spectacular work of repairing and cleaning the Washington monument, famous capitol landmark. Not the least interesting feature of this undertaking was the use of a steel scaffold, completely surrounding the monument and providing access to its entire exterior surface, making possible minute investigation and inspection of the 50-year-old structure. Six hundred tons of steel was required for the scaffold, 450 tons of which were standardized tubular parts, representing some 50 miles of pipe. The remaining 150 tons consisted of specially designed structural steel grillages, set-back framing, and horizontal sway-girders which when combined with the portable scaffold parts resulted in an economical steel tower possessing both strength and portability.

Except for its magnitude, the general scaffold design and layout follows closely the methods previously employed by the subcontractor on high stack jobs. The scaffold rests on a steel I-beam grillage, providing a uniform distribution of the loads from the scaffold posts to the sidewalk around the base of the monument. Wind girders, placed in a horizontal plane inside of the scaffolding, are spaced every eight vertical sections, or 52 feet apart, throughout the entire height of the structure. They are clamped in position on the scaffold posts, and are designed to transmit all wind and lateral stresses to the side bents of the integral steel tower.

Set-backs in the tower are provided at the 250, 500, and 525 foot levels. At these elevations, the lower scaffold posts are capped with I-beams to support the outside line of posts above. The inside line of posts is supported by steel trusses paralleling the four faces of the monument. Bearing on I-beam grillages, the reactions from the trusses are distributed to the scaffold posts below the set-backs.

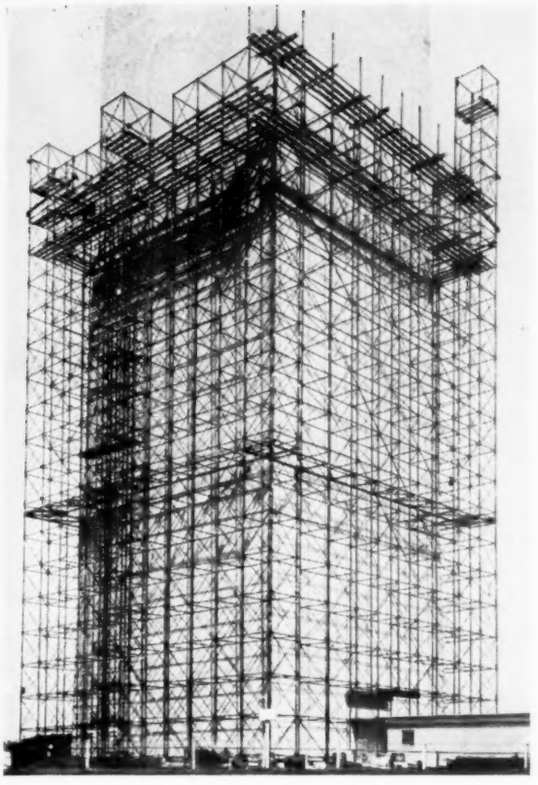
The entrance on the east side of the monument was protected by a covered passageway, the steel framework of which was also of tubular construction. This passageway continued from the entrance to the circular driveway around the monument, keeping the entrance clear.

Elevator in Scaffold

A passenger elevator, the shaftway for which was an integral part of the scaffolding, provided access to the working platforms up to the 500-foot elevation. The elevator equipment was designed and erected in accordance with the state regulations of Pennsylvania. Steel ladders also were installed throughout the entire height of the scaffold.

The project was financed with PWA funds and executed through the department of the interior, national parks service. General contract for the scaffolding, as well as the cleaning and repairing of the monument, was held by Alexander Howie Inc., Cleveland. The steel scaffolding was designed and furnished by the American Tubular Ele-

Spidery envelope of steel scaffolding as it appeared on the monument at a distance



CLOSEUP view during erection of the scaffolding. Note wind girders placed at eighth vertical section; these were installed 52 feet apart the entire height of the monument. Elevator shaft may be seen at the left

vator Co., Pittsburgh, as subcontractor. The cleaning job has already been completed and dismantling of the scaffolding started.

Wrought Iron Plates For High Stack

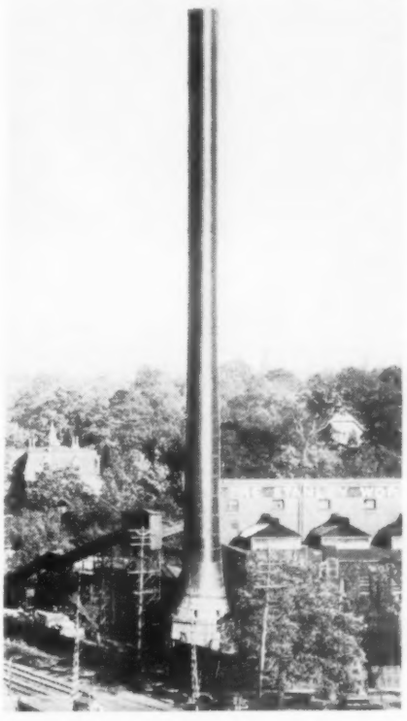
A NEW stack, recently completed for main power plant of the Stanley Works, New Britain, Conn., by the Chicago Bridge & Iron Works, Chicago, is constructed largely of wrought iron plates supplied by A. M. Byers Co., Pittsburgh. The stack, shown in the accompanying illustration, is 11 feet 4 inches in diameter and 200 feet high, 170 feet of which is fabricated of wrought iron plates, 5/16-inch minimum thickness with 2½ inches of gunnite as a lining.

The bottom section of the original stack, 30 feet in height has been retained in the structure, this section having been lined with refractory brick and found to be in satisfactory condition when dismantled.

Running the entire height on the exterior of the stack is 200-foot ladder built of wrought iron rounds and bars. Selection of wrought iron plates for the stack was made for their superior resistance to corrosive elements existing in stack structures.

After erection, the stack was painted with one coat of orange chromate and two coats of black graphite paint.

The original stack, entirely of steel, was erected in 1906. In 1926 is was found necessary to replace the top 75 feet and again steel plates were used. After eight years, corrosion has reached a point requiring the replacement of 175 feet.



The upper 170 feet of this rebuilt 200-foot power plant stack is of wrought iron plates, with 2½ inches of lining and painted on the outside

Develop New Method for Copper Plating on Aluminum

A method is reported to have been developed in Germany to produce a copper plating on aluminum which will not peel off and which is applied without the use of electric current, according to Assistant Trade Commissioner Rolland Welch in a report to the department of commerce.

Aluminum articles to be plated are first polished with an abrasive and then placed in a cleaning bath which, at the same time, is a preliminary copper plating bath. This treatment first removes completely the coating of oxide on the aluminum which is otherwise difficult and also produces a thin coating of copper on the metallic aluminum. As soon as this copper coating is formed, the assurance is given that all traces of aluminum oxide have been removed. The articles are then removed from the bath and immediately rinsed in plain water and then rubbed dry with a woolen cloth. This rubbing removes the black surface produced by the acid on the copper plating and the copper appears red.

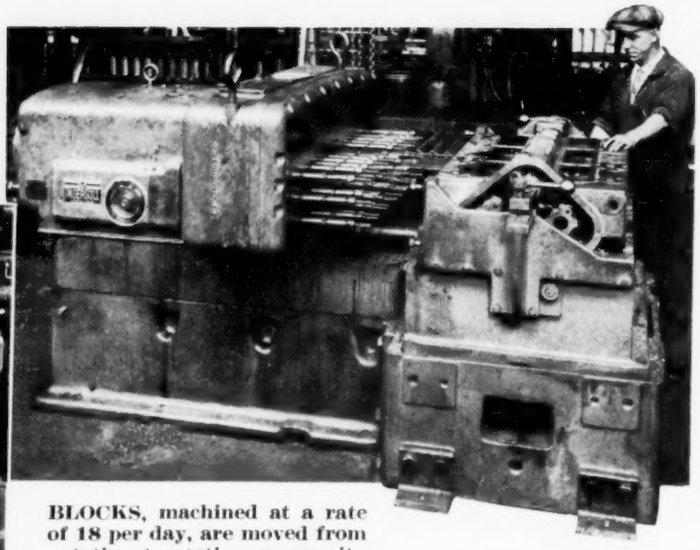
When the articles are perfectly dried, they are placed in a second or the actual copper plating bath, in which plating of any desired thickness can be obtained. The thickness of the copper coating depends on the time the articles are immersed in the bath, the report states.

Plating produced in this manner, it is pointed out, is said to be so firm that the articles can be subjected to any further processing without fear that the copper plating will peel off or lose its close contact with the basic metal.

Alloy Prolongs Life of Crusher Jaw Plates

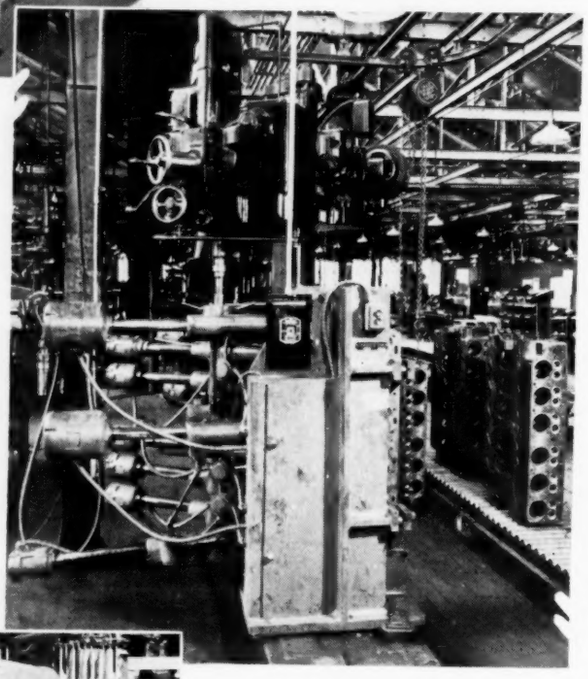
Abrasive efficiency of molybdenum steel recently was demonstrated by a crusher jaw plate of the moving type containing 0.75 per cent carbon, 1.35 manganese, 0.25 silicon, 1.40 chromium and 0.40 per cent molybdenum. The crusher was used to break ferromolybdenum low in carbon and silicon from about 8 inch diameter lumps to 1½ inches diameter. After 520,000 pounds of this material passed through the crusher, the jaw was removed for inspection and found to be worn somewhat but not to any great extent. The jaw was conditioned at 1800 degrees Fahr., air quenched from 1650 degrees Fahr. and drawn at 500 degrees Fahr. to give an average brinell of 388.

Machining Operations On "Pancake" Engine

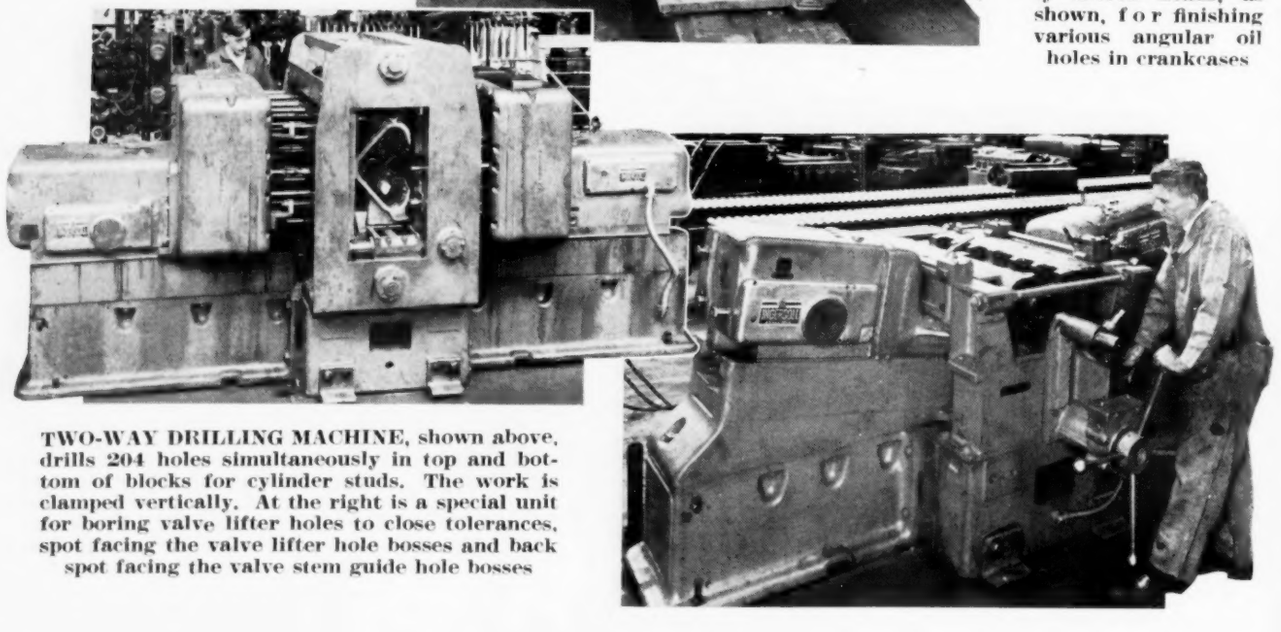


BLOCKS, machined at a rate of 18 per day, are moved from station to station on gravity roller conveyors

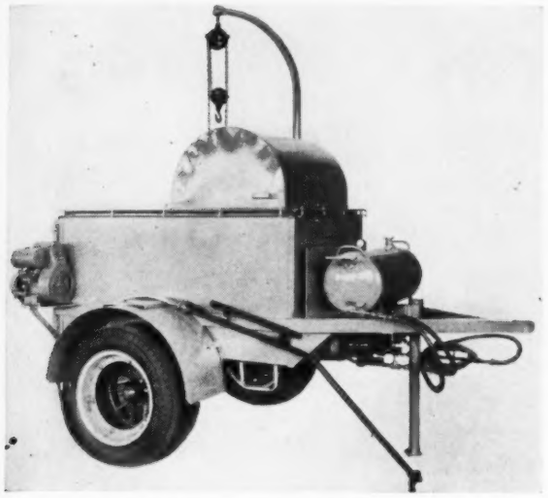
INVESTMENT OF $125,000 in new machine tools, fixtures and retooling of old machines by the White Motor Co., Cleveland, for the production of its new horizontal-opposed 12-cylinder truck engine involved installation of a number of special or multipurpose machines for work on the engine block, shown on this page. The machine above drills and rifle bores oil lead passages in the cylinder block, eight drills working simultaneously. The block is of nickel-chromium cast iron for wear resistance



BORING AND TAPPING of cylinder head stud holes on the sides of the block are accomplished by the machine above, using two interchangeable heads, the first equipped with 38 drills, the other with 38 ground thread taps. At the left is an unusual piece of equipment, built around a standard radial drill, and embodying two separate fixtures, one on each side of the column. On one fixture the drill head operates a milling attachment which cuts a clearance slot between adjacent valve ports. The other fixture is in reality a multiple head machine comprising ten individually driven heads, as shown, for finishing various angular oil holes in crankcases



TWO-WAY DRILLING MACHINE, shown above, drills 204 holes simultaneously in top and bottom of blocks for cylinder studs. The work is clamped vertically. At the right is a special unit for boring valve lifter holes to close tolerances, spot facing the valve lifter hole bosses and back spot facing the valve stem guide hole bosses



—Photo courtesy White Mfg. Co., Elkhart, Ind.

MODERN type of tar kettle, oil fired, with engine-driven spraying equipment. Ninety per cent of its weight is steel

LARGE USES OF STEEL IN SMALL WAYS

278th Article ◆ Tar Kettles

MAINTENANCE of highways, streets and roofs, and insulation of pipes and conduits contributes a moderate volume of steel consumption annually in the manufacture of tar and asphalt melting and heating kettles.

This apparatus is employed widely by state, county and city highway departments, as well as by commercial roofers and public utilities. Production of tar kettles began many years ago, principally for application and repair of bituminous roofing. At that time, kettles were constructed crudely and fired by coal or wood, on cast iron grates. Considerable advance in design since has been made.

Oil burners were applied a few years ago and nearly all kettles now being made are so equipped. Solid rubber tires supplanted the original steel tires and these in turn have been replaced by pneumatic balloons. The larger kettles now commonly are furnished with air-cooled gasoline engines driving centrifugal pumps and spraying outfits, thus becoming small tar or asphalt distributors.

These machines comprise essentially an inside kettle with outer box or housing, frame and running gear, with accessories. The kettle proper has rounded bottom, made of 10-gage to ¼-inch firebox sheet steel, with ends electrically welded into place. The enclosing housing is also sheet steel, usually of 10 or 12-gage, depending on the size of the outfit. It is also customary to use 14-gage liner plates inside the housing to prevent direct flame action on the main box. The box ends are lapped over the sides and bottom and electrically welded. The box sides and bottom are formed from one sheet.

Around the housing and welded to it is the main frame, made of 2 to 3-inch channel sections, and formed to a point at the front where the towing eye is attached. Steady rests are placed at the front and sometimes also at the rear, usually a heavy pipe or angle, enclosed in a cast or fabricated steel holder.

Tops Made in Several Designs

To the frame are attached conventional semi-elliptic springs and steel axle. The axles on light weight kettles generally are built up from two small channels, electrically welded, and with high carbon steel stub ends for wheel bearings. On heavier types solid axles are supplied, employing alloy steel squares, turned at the ends for wheel bearings. Semi-elliptic springs have come into vogue in recent years, supplanting coil springs and round steel axles.

Tops for the kettles are of several designs, all usually gas welded to the kettle itself and made of 14-gage sheet. Some tops have hinged hatchways for loading bitumen and may have a warming hood of 16 or 18-gage steel to accommodate an extra drum of material which drains into the kettle as it melts.

One manufacturer has developed a fireproof tar kettle design by substituting a 14-inch diameter dished and flanged steel tank head in place of the hinged hatch cover. A simple steel clamping arrangement and an automatic overflow and pressure release are included. This has overcome a serious fire hazard presented by the use of highly inflammable asphaltic oils, known as cut-backs, extensively employed on highways.

Heating Equipment Requirements

The heating equipment involves one or two self-generating oil burners, made of coiled ⅜-inch steel pipe or seamless tubing and encased in various ways by different producers. These burners consume from 2 to 5 gallons of kerosene or distillate per hour and generate a temperature of from 1600 to 1800 degree Fahr. Fuel is carried in steel tanks of from 14 to 20-gallon capacity, with self-contained hand air pumps and pressure gages. The tank and burners are connected by oil-resisting rubber hose and are removable from the machine.

Common accessories frequently furnished are barrel hoist, consisting of tubular steel davit and chain fall; spraying equipment and thermometer.

These machines weigh from 900 to 3000 pounds each and approximately 90 per cent of their weight is steel. No figures are available on total annual production but probably about 700 of such units are constructed yearly.

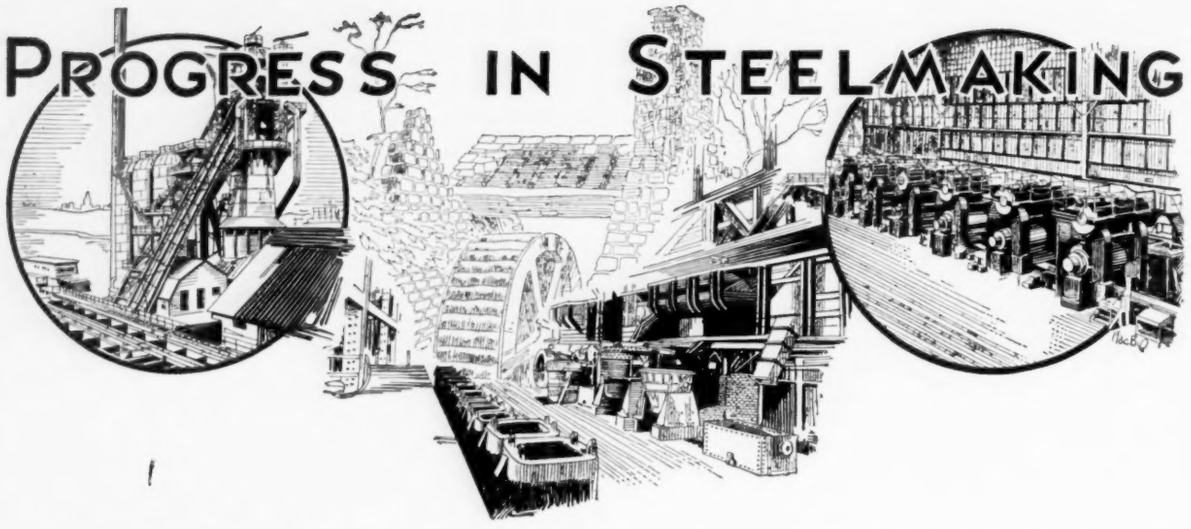
New Primer Coating for Rusted Steel Surfaces

A new paint base, known as Bar-Ox penetrating primer, has been developed by the Truscon Steel Co. at its laboratory in Detroit. Its action is said to be one of penetrating and soaking into rust, rendering the rust dormant to further activity. It is recommended for use on steel surfaces which have developed a coating of rust and which are difficult to clean. The new material is intended to be used as a primer coat, with the finishing coat of paint applied over it.

Makes New Steel Lath

A new steel lath for plastering has been placed in production by Penn Metal Co., 40 Central street, Boston. It is provided with a Kraft board backing. This not only serves as insulation against heat and cold but acts as a centering device and prevents waste of plaster. In addition, this board is said to form a reinforced wall or ceiling slab of greater strength.

PROGRESS IN STEELMAKING

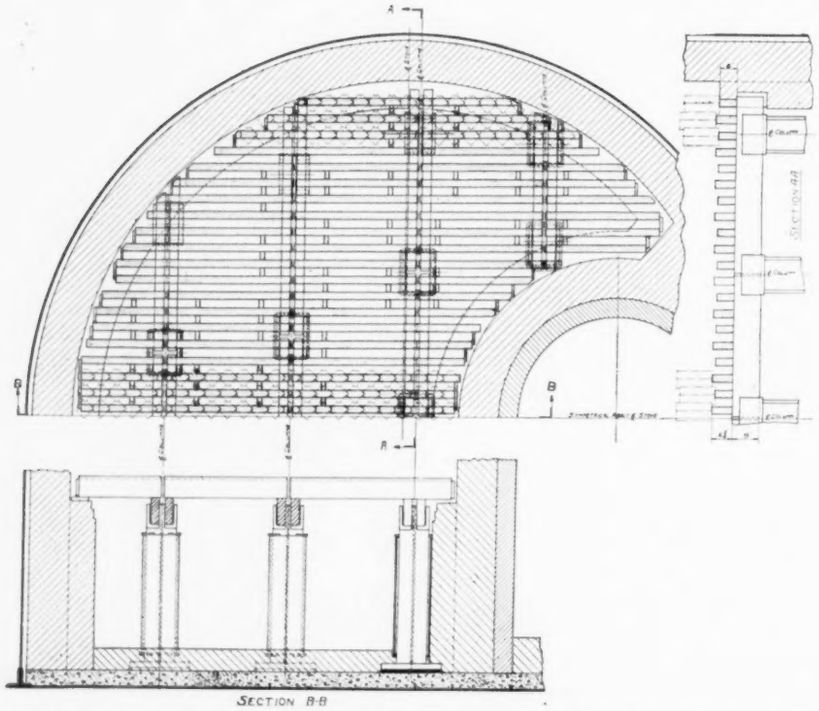


Wire Is Made Rustproof

An electrolytic galvanizing process now is employed by an eastern wire-maker. The zinc solution goes forward to the cells where it is electrolized, using anodes of silver-lead alloy and cathodes of wire being coated. This results in the deposition on the wire of a uniform layer of high purity zinc which can be carried to any desired thickness. The wire on its way to each galvanizing cell passes through a steel trough containing fused sodium hydroxide and carbonate. The wire is made the cathode and this results in the liberation of nascent metallic sodium which reduces the oxide back to metallic iron. Other impurities such as sulphur, silicon and carbon, are removed. The resultant clean surface consists of substantially pure iron and is much less subject to rusting than steel pickled with acid. Advantages afforded by the process are that the steel may be given heat treatment while being cleaned and the metal can be stored without rusting.

• • •

Standard Rolled Sections Are Used



BLAST FURNACE CHECKER SUPPORT: A steel bottom that will carry the checker load independent of the other parts of a hot blast stove and with every member of the bottom free to expand and contract independent of every other member, now is in service. The 12-inch H-section column is mounted on and welded to a heavy 2-inch slab. A cover plate, ½-inch thick, protects this column from the abrasion of the incoming air. Two heavy angles, 1-inch thick, are welded on top of the column to provide suitable guides in which the girders rest and ride, free to expand lengthwise. The steel grid bars on which the checkers rest are spaced sufficiently far apart to allow for expansion of the checkers; each course of checkers is locked horizontally. By a slight modification of the grid construction, the bottom, which was introduced by the William M. Bailey Co., Pittsburgh, can be built to suit checkers of the standard box type

Discloses Surface Defects

Sodium lamps are being employed by a New England strip mill for inspecting the surface of cold rolled strip. This type light has the definite advantage of disclosing defects more clearly than ordinary illumination.

• • •

Hinders Tight Coating

Palm oil through which tin plate passes after it leaves the bath of molten tin in the tinning machine, frequently prevents the decorative enamel and varnish from sticking properly.

• • •

Simplifies Installation

Welding studs to steel surfaces for hanging piping, conduits, instruments, hooks and insulating materials around steel plants has been made possible by the development of a stud welder. A stud is placed in the welding gun, pressed against the surface to which it is to be joined, and one automatically timed impulse of power completes the weld. The stud is held against the work under spring pressure by the welding gun through which the welding current is directed. The timer is adjustable for periods of from 1/12 to 5/6 of a second, the exact time used depending on the size of stud being applied.

Once adjusted, the timer repeats the desired duration of current flow for each weld.

♦ ♦ ♦

New Use for Furnace Slag

Blast furnace slag is being used by a European wire producer as a wipe for netting and telegraph wire, according to a wire mill engineer.

♦ ♦ ♦

Cost of Mill Operation

Based on a 6-day week operation and a power cost of $0.005 per kilowatt hour, motor-driven mill equipment costs a minimum of $28 per horsepower per year, according to a lubricating engineer.

♦ ♦ ♦

Restrains Growth of Metal

Growth of cast iron in ingot molds can be stopped by the element chromium. Approximately 0.60 per cent chromium will reduce the growth of cast iron about 10 per cent of that before the addition was made.

♦ ♦ ♦

Checks Thickness Readily

Testing the thickness of boiler tubes, and of thin sheets and plates when only one surface is available is being done in England by a recently devised apparatus. The essential parts are two similar electromagnets and a movable iron measuring instrument connected in a Wheatstone bridge circuit. During a test the searching magnet is located at variable points on the surface or inside of the tube, the actual thickness being indicated directly on a voltmeter. Tests disclose a variation of 0.005-inch from micrometer readings.

♦ ♦ ♦

Develops Safety Blowpipe

Experimental work has resulted in the development of a new safety blowpipe for blast furnaces. Between the outer steel tubular member and the inner sleeve of heat-resisting alloy is a layer of either powdered or granular insulation. A casting is provided at the front end for engaging with the tuyere and at the rear end for engaging with the tuyere stock. Tests on 14 insulated blowpipes 3¾ feet long disclose a saving of about 3½ tons of coke per 24 hours. This saving in heat, in the opinion of experienced blast furnace engineers, is not as significant as the saving in blast temperature disclosed by the tests.

Will Report Upon Research Program

REPORTS on metallurgical investigations made at Carnegie Institute of Technology during the past year will be presented at the eighth annual open meeting of the metallurgical advisory board to be held Feb. 8 at the institute in Pittsburgh. Approximately 400 metallurgists are expected to attend the meeting.

Dr. John Johnston, director, research laboratories, United States Steel Corp., Kearny, N. J., will preside at the morning session, and Dr. F. N. Speller, director, metallurgy and research, National Tube Co., Pittsburgh, and chairman of the board, will make the address of welcome.

Progress made by the metals research laboratory of Carnegie institute in theoretical investigations will be reported by the director, Dr. R. F. Mehl. The various projects now being studied are classified under four major heads, namely plastic deformation of metals, precipitation from solid solution, oxidation of metals, and diffusion in metallic alloys. Dr. F. M. Walters Jr., formerly of the staff of this laboratory, will offer a final report on the "Constitution of Iron-Manganese and Iron-Manganese-Carbon Alloys," which he investigated for several years.

Will Discuss Pure Iron

Dr. Cyril Wells, also of the metals laboratory, will explain the preparation and properties of high purity iron and will report on a study of the "Constitution and Behavior of High Purity Iron-Carbon Alloys." The final report of the morning session will be read by B. N. Daniloff, research fellow, on the "Effect of Deoxidation on the Aging of Mild Steels."

H. W. Graham, general metallurgist, Jones & Laughlin Steel Corp., Pittsburgh, will preside at the afternoon session at which Dr. C. H. Herty Jr., research engineer, Bethlehem Steel Co., Bethlehem, Pa., and former director of research for the advisory board, will report on all of the studies which were made under his direction at the institute.

These reports will conclude the program of research on the physical chemistry of steelmaking which has been carried out for the past eight years by the board. The subjects of the reports to be given by Dr. Herty include the "Effect of Deoxidation on the Impact Strength of Carbon Steels at Low Temperature," "Rate of Transformation and Grain Sizes," "Deoxidation of Steel," and "Control of Iron Oxide in the Basic Open-Hearth Process."

An informal dinner at the University club will conclude the meeting. J. Steel Gow, director, Falk Foundation, will speak on "Research in the Economic Field."

South American Ore and Industry Are Studied

Ores and Industry in South America; by H. Foster Bain and Thomas Thornton Read; cloth, 381 pages; published by Harper & Bros., New York; supplied by STEEL Cleveland, for $3.50, plus 15 cents for postage; in Europe by the Penton Publishing Co. Ltd., Caxton House, Westminster, London.

More and more business men in the United States are becoming interested in the possibilities of the countries of South America with reference to industry and commerce. The question often is advanced whether South America can be expected to repeat the course of industrial growth and development which has been achieved in North America. The authors of this book are familiar with South America at first hand, one or the other having visited nearly every country. The book is an outgrowth of a series of conferences held by the minerals group of the Council of Foreign Relations in 1931 and 1932.

The authors have discussed the general problems of the vast undeveloped resources in South America, studied the geography and geology of the continent, and dealt individually with the various countries, including Colombia, Venezuela and Trinidad, the Guianas, Brazil, Uruguay and Paraguay, Argentina, Chile, Peru, Bolivia and Ecuador.

In conclusion it is thought that South America will maintain the role of exporter of minerals.

Molybdenum and Its Use in White and Gray Cast Iron

Use of molybdenum for improving properties of various grades of cast iron was referred to in the annual review of foundry developments presented on page 158 of STEEL for Jan. 7. In this review an observation of the Climax Molybdenum Co., New York, was cited regarding the use of molybdenum-bearing malleable iron for ball mill liners, pulverizer parts, coke screens and grizzlies, and coffee mill burrs. This was an error by STEEL, these parts, as later pointed out by the Climax company, being of molybdenum-bearing *white* iron, essentially similar to malleable iron, but unannealed.

In the same article comment was made on the use of molybdenum to improve toughness, uniformity, wear and heat resistance in gray iron castings. It was stated that only small amounts are needed, varying

from 0.07 to 0.20 per cent. While extended use is being made of molybdenum in small amounts such as this range indicates, the actual range of molybdenum in gray iron is from 0.07 to 1.50 per cent.

STEEL is glad to make these corrections.

Mining and Metallurgical Engineers Announce Program for Annual Meeting

AN ATTRACTIVE array of technical sessions is announced in the preliminary program of the American Institute of Mining and Metallurgical Engineers for its 144th regular meeting to be held at the Engineering Societies building, New York, Feb. 18-21. Of interest to the iron and steel and metalworking fields are the meetings of the iron and steel division, the institute of metals division and the petroleum division.

Eight sessions, covering a wide range of subjects, are scheduled by the iron and steel division, including the Howe Memorial lecture on steel melting to be presented by Earl C. Smith, chief metallurgist, Republic Steel Corp., Youngstown, O. This division also will hold a luncheon meeting on Wednesday, Feb. 20.

Special Features of Meeting

The institute of metals division has arranged three technical sessions on its own behalf, not including the annual lecture on Thursday afternoon, Feb. 21, at which Dr. C. A. Edwards, professor of metallurgy, University college, Swansea, Wales, will discuss gases in metals. The annual dinner of this division will be served at the Commodore hotel, Tuesday evening, Feb. 19, upon which occasion D. J. Macnaughtan, director of research, International Tin Research and Development council, London, will speak on the properties and uses of tin.

Both the iron and steel and institute of metals divisions will meet jointly with the petroleum division on Thursday, Feb. 21, this division having arranged a two-session symposium on use of metals in the petroleum industry.

The annual dinner of the institute will be served on Wednesday evening, Feb. 20, at the Commodore hotel at which time medals and awards will be made. The Saunders medal will be presented to James MacNaughton, president, Calumet & Hecla Consolidated Copper Co., Calumet, Mich.; the Douglas medal to George Cameron Stone, New York; and the Johnson award to Francis M. Rich. Honorary membership is to be conferred upon T. A. Rickard, historian and anthropologist, Victoria, B. C.

The schedule of technical sessions and papers to be presented are as follows:

Iron and Steel Division

Monday, Feb. 18

MORNING

"Some Observations and Theory on Slack Wind Blast Furnace Operations," by Francis M. Rich.

"Notes on Development of Iron Blast Furnace," by A. J. Boynton and S. P. Kinney.

"Blast Furnace Fuels: Anthracite," by Ralph H. Sweetser.

AFTERNOON

"Foreign Ores Used in the United States Which May Conflict with Our Production," by Charles Hart.

"Trend of Ore Treatment and Its Bearing on Lake Superior Iron Ore Reserves," by Carl Zapffe.

"The Refractories Industries," by Paul M. Tyler and R. P. Heuer.

Tuesday, Feb. 19

MORNING

"Some Observations on Sponge Iron and the Properties of the Direct Steel Made from It," by R. S. Dean, E. P. Barrett and Calvin Pierson.

"Ores and Sponge Iron," by Nils K. C. Tholand.

Discussion of G. B. Waterhouse fall meeting paper, "Manufacture, Properties and Uses of Sponge Iron," by Fred Jordan.

"A New Swedish Sintering Process," by Nils K. C. Tholand.

AFTERNOON

"Some Effects of Copper in Malleable Iron," by Cyril S. Smith and Earl W. Palmer.

"The 'Plasticity' of Iron at Low Temperatures," by K. Heindlhofer.

"Temperature Measurements in Small Heats of Molten Steel," by D. J. Martin.

Wednesday, Feb. 20

MORNING

"The Solubility of Nitrogen in Liquid Iron," by John Chipman and Donald W. Murphy.

"Metallurgical Effects Produced in Steel by Fusion Welding," by A. B. Kinzel.

"Manufacture and Properties of Bessemer Steel," by C. C. Henning.

AFTERNOON

"Magnetic Precipitation Hardening of Iron Due to Oxygen," by T. D. Yensen and N. A. Ziegler.

"Solubility of Copper in Iron and Lattice Changes During Aging," by John T. Norton.

"The Relation Between Hardening Power and Stability of Hardness in Steel Tempered in the Presence of Special Carbides at Low Solubility with Particular Reference to Vanadium Steels," by E. Houdremont, H. Bennek and H. Schrader.

"The Linear Expansion and Transformation Phenomena of Some Low-Carbon Iron-Chromium Alloys," by J. B. Austin and R. H. H. Pierce Jr.

"Dependence of the Rate of Transformation of Austenite on Temperature," by J. B. Austin.

"Reactions in Solid State, I—Initial Course of Subcritical Isothermal Diffusion Reactions in Austenite in an Alloy Steel," by Howard A. Smith.

Howe Memorial Lecture

"Some Studies of Problems in Steel Melting," by Earl C. Smith, chief metallurgist, Republic Steel Corp., Youngstown, O.

Thursday, Feb. 21

MORNING

"Comments on the Insulation and Control of Open-Hearth Furnaces," by William C. Buell Jr.

"Ladle and Teeming Practice in the Open-Hearth Department," by G. D. Tranter.

"A Chemical Engineer Views the Steel Industry," by Charles F. Ramseyer.

"The Wrought Iron Problem of Today," by James Aston.

AFTERNOON

Joint Session with Institute of Metals and Petroleum Divisions

Symposium on Use of Metals in the Petroleum industry.

Petroleum Division

Thursday, Feb. 21

MORNING AND AFTERNOON

Joint Sessions with Institute of Metals and Iron and Steel Divisions

"The Corrosion Problem," by J. E. Pollock.

"Heat-Resisting Alloys," by W. F. Furman.

"Heat Interchangers and Condensers," by H. L. Bedell.

"Refinery Pumps," by A. E. Harnsberger.

"Development in Pipe and Tube Products," by E. C. Wright.

"Sucker Rods," by B. B. Wescott.

Institute of Metals Division

Tuesday, Feb. 19

AFTERNOON

"Internal Surface in Minerals and Metals," by R. S. Dean and J. Koster.

EVENING

Annual dinner. Address: "Properties and Uses of Tin," by D. J. Macnaughton, director of research, International Tin Research and Development council, London.

Wednesday, Feb. 20

MORNING

"Equilibrium Relations in the Copper Corner of the Ternary System: Copper-Tin-Beryllium," by Elliott S. Rowland and Clair Upthegrove.

"Studies Upon the Widmanstatten Structure, VII—The Copper-Silver System," by Charles S. Barrett, Herman F. Kaiser and Robert F. Mehl.

"Physical and Castings Properties of the Nickel Silvers," by T. E. Kihlgren, N. B. Pilling and E. M. Wise.

AFTERNOON

"Crystallographic Uniformity of Lineage Structure in Copper Single Crystals," by Alden B. Greninger.

"Theory and Use of the Metallurgical Polarization Microscope," by Russell W. Dayton.

"Properties of Platinum Metals, I—Strength and Annealing Characteristics of Platinum, Palladium and Several of Their Commercial Alloys," by E. M. Wise and J. T. Eash.

Thursday, Feb. 21

MORNING AND AFTERNOON

Joint Sessions with Iron and Steel and Petroleum Divisions

Symposium on Use of Metals in the Petroleum Industry.

AFTERNOON

Annual Lecture

"Gases in Metals," by Dr. C. A. Edwards, professor of metallurgy, University college, Swansea, Wales.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Portable or Lance Type Pyrometer—Russell Electric Co., 333 West Huron street, Chicago, now is offering a pyrometer of the portable or lance type, shown herewith. Meters are available for three different temperature ranges of 800-1600-2500 degrees Fahr. The instruments are of the low resistance type, thereby combining high accuracy in combination with very rugged construction. These new instruments are streamlined in conformity with modern tendencies of design. The entire protecting case and handle is a single aluminum casting.

These portable hand instruments

Russell portable or lance type pyrometer

will serve for checking temperatures in all the applications where a wall type pyrometer is used. For general use it has the additional advantage of portability. It is unequalled as an exploring instrument to gather heat data in chemical and industrial processes. It is exceedingly well adapted to use as a trouble shooter and as a check tester in existing pyrometer installations.

For checking temperatures on billets, slabs, forgings, etc., a special thermocouple holder is employed with two straight tips which are sharpened at the point. By firmly pressing the tips against a high temperature surface, they will pass through the surface oxide and complete the circuit, giving an accurate, instantaneous temperature reading.

♦ ♦ ♦

Goggle—American Optical Co., Southbridge, Mass., has placed on the market a new goggle, shown herewith, that practically doubles the area usually allowed for ventilation. The extra ventilation back of the lenses keeps them free from fogging and steaming—and also keeps the area around the eyes cool and so prevents perspiration from obscuring the vision. The hazards of stumbling, falling or colliding with objects because of obscured vision

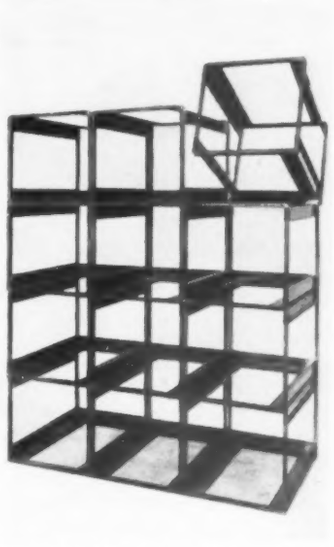
Ventilation prevents American goggle from fogging and steaming

due to fogged lenses, are eliminated by these new goggles. Besides providing clear and comfortable vision "Duralite-50" hot workers' goggles provide dependable eye protection, the manufacturer brings out.

♦ ♦ ♦

Stacking Rack—Stackbin Corp., Providence, R. I., is manufacturing a new item to add to its line of stacking devices. This "Stackrack," shown herewith, is a single unit rack made of channel and angle steel construction, solidly welded at all contacting points. A lip running the entire width hooks under at the back and a close fitting channel at the front completes this efficient yet simple lock. These units are made to order for cardboard, fibre, wood or steel boxes of any size. The size of channels, angles etc. is governed by the weight of material in the boxes.

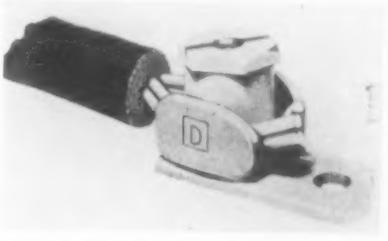
This rack successfully solves any box stacking problem and can be used in places such as under benches, behind machines, auxiliary stockrooms etc. as the bottom box is always as accessible as the top one. The olive green baked on enamel gives them a finish which with normal care should last indefinitely, the manufacturer declares.



"Stackrack" recently placed on the market by Stackbin Corp.

♦ ♦ ♦

Solderless Connector—Square D Co., Switch and Panel Division, Detroit, is introducing a new solderless connector, shown herewith, consisting of a copper cup with enclosing sides and raised lip of curved contour at the wire entrance, a specially design hexagon nut and a stud. The hexagon nut, which can be turned by either a screwdriver or a wrench, presents smooth rounded surface to the conductor and forces the wire strands into the recess of the cup and compresses them so forcefully that a much better contact and more secure mechanical bond is formed than by the ordinary solder lug, it is claimed.



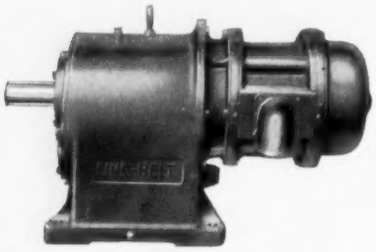
Square D solderless connector made in two sizes to meet requirements

Design of the connector precludes any possibility of vibration loosening the conductor, insuring a positive permanent connection. The connector can be used for either solid or stranded conductors. One outstanding feature of the new connector is the fact that it fits in the same space as a solder lug, so that it can be adapted to standard switches without danger of exceeding electrical clearances. The new connector is made in two sizes: for No. 14-to No. 4 wire inclusive (nominal 60-ampere size) and for No. 14 to No. 1 wire (100 ampere size).

♦ ♦ ♦

Motorized Reducers—Link-Belt Co., 910 South Michigan avenue, Chicago, announces that it is placing on the market a new line of motorized helical gear reducers, an outstanding feature of which is the unusual accessibility of the motor and the high speed gears. A standard round-frame motor conforming with National Electrical Manufacturers' association specifica-

tions, is secured firmly to side of reducer housing by means of an adapter casting which supports the motor shaft in over-size antifriction bearings close to the pinion, thus assuring good alignment and proper mesh of pinion with its mate. The complete motor, with adapter and



Motorized helical gear reducer developed by Link-Belt Co.

and motor pinion, may be removed as a unit for inspection or maintenance, without disturbing the alignment of the motor, or of the gears remaining in the reducer housing; in fact, the motor pinion and gear are removable without disconnecting the driven machine or disturbing the low speed gears.

The low speed shaft and its bearings are designed to carry overhung loads. A well-braced and ribbed gray iron housing provides a rigid mounting for the bearings, shafts and motors, as well as constituting a liberal-sized reservoir for automatic lubrication of the gears and bearings. Seals are provided at shaft openings to keep the oil in the housing, and the grit and dirt out.

The new motorized reducers, shown herewith, may be mounted on floor, ceiling or wall; and are available in double reduction for ½ to 75 horsepower, in ratios up to 38½ to 1, and in triple reduction up to 30 horsepower, in ratios up to 292 to 1. They embody the usual advantages of not requiring a motor base plate or a high speed shaft coupling, and as the motor forms an integral part of the reducer, the proper alignment of motor shaft is definitely assured at all times.

♦ ♦ ♦

Rubber Tank Lining — American Hard Rubber Co., New York, is announcing an improvement in rubber linings for tanks employed in processing operations using highly corrosive solutions. The new lining, known as M R-10, is characterized by a high glaze surface which offers greater resistance to acids and alkalis and is more easily cleaned.

Outer layer of glazed rubber is securely bonded to a relatively thin inner layer of soft rubber which is in turn vulcanized to the steel tank. This soft rubber lamination provides an elastic contact which compensates for contraction and expansion of metal and rubber during changes of temperature. It also acts as a shock absorber to protect the lining against accident and abuse. Another feature of the new lining is the use of heavy soft rubber fillets underneath the lining in all corners.

♦ ♦ ♦

Locomotives—Davenport Locomotive Works, a division of the Davenport Besler Corp., Davenport, Ia., is announcing a new series of industrial gasoline and diesel geared locomotives ranging in capacity from 2½ to 25 tons. The latest, most approved types of power plants are utilized in powering these units, shown herewith. Particularly noteworthy is the diesel type of unit which offers the best advantages of this increasingly popular type of power.

These locomotives meet the requirements of a wide variety of services. They are rugged examples of locomotive design, have a wide range of speeds and are capable of maximum hauling power at speeds as low as 2½ to 3 miles per hour, according to the size of the unit. Cabs are roomy and comfortable with convenient controls and instrument panels which keep the operator completely informed concerning the operating essentials at all times.

Powerful hand-operated lever type brakes are standard on all of the smaller sizes up to 12 tons. On

One of the new series of Davenport industrial locomotives

the 7 to 12-ton sizes air brakes are optional. The 15 to 25-ton sizes are standard equipped with air brakes and auxiliary hand-operated brakes of lever type.

♦ ♦ ♦

Oil Burner—Philadelphia Drying Machinery Co., 3351 Stokley street, Philadelphia, recently brought out an oil burner which is adapatable to heating furnaces, ovens, dryers, lehrs and preheaters. The unit is shown herewith. Efficient combustion over a wide range of capacities with various grades of fuel is attained by a unique design which governs the regulation and also the distribution, velocity and turbulence of the primary and secondary air as it comes into contact with the oil. Ease of regulation, in turn, allows close control of furnace atmosphere. Efficiency of the burner when handling fuel oil in capacities as low as ⅛ gallon per hour makes it possible to distribute the heat uniformly throughout the furnace by burning a small quantity of oil in each of a large number of burners.

Oil enters through a small supply line at the back, passes through a central oil tube to a distributor inside the burner housing, where it is

Oil burner designed recently by Philadelphia Drying Machinery Co.

directed into an oil chamber surrounding the primary air orifice. There are nine sizes of burner in the line, ranging from ¾ to 6 inches for pressures ranging from 8 to 32 ounces of air and for capacities of ⅛ gallons per hour and upward.

♦ ♦ ♦

Unit Oil Seal — Garlock Packing Co., Palmyra, N. Y., recently placed on the market a new unit oil seal which employs a packing member made of a composition material having the characteristics necessary to withstand oil seal service. The unit, shown on page 41, has only four parts, the adapter, the spreader, the sealing member and the case. The sealing ring is of distinctive shape, the composition material being molded under heat and pressure into a ring having a cross-sectional shape resembling a modified V. The spreader is a flexible metal ring with serrated or saw tooth edges formed into a V shape to fit into the convex face of the sealing ring. The angle of the V in the spreader is broader than the angle of the sealing ring; therefore, when the seal is assembled and the

Garlock unit oil seal employs composition packing member

spreader brought into contact with the sealing ring its saw toothed edges or fingers bear upon the sealing ring causing it to hug the shaft.

The adapter, a metal ring flanged to contact the spreader, bears against the packing ring, holding it firmly in place in the case and preventing leakage between the outside diameter of the ring and the case, and exerts constant pressure upon the spreader. As in all self-contained or unit seals, a metal case or housing encloses the several parts. The last operation in the assembly of this seal is to flange the edges of the case over the adapter ring. This holds the parts firmly in place, combining them into a unit. The seals are made in a wide range of standard sizes to fit shafts from ¾ to 3 inches diameter. For most shaft sizes, standard cases in a number of different diameters and depths can be furnished.

♦ ♦ ♦

Blueprint Papers and Cloths—C. F. Pease Co., 823 North Franklin street, Chicago, is offering blueprint paper and cloth which will not "bleed." With this type K speed sensitized paper and cloths it is said that prints may always be fully exposed or even over-exposed and yet produce a deep blue and permit the whites to stand out in sharp contrast. It is not necessary to block out behind each blue line print when using the new paper. The papers and cloths are available in all standard lengths, widths, weights and rag content, in rolls or standard cut sheets.

♦ ♦ ♦

Plastic Material—B. F. Goodrich Co., Akron, O., has developed a new plastic material, said to be superior to rubber for the manufacture of a wide variety of products. The material may be molded into any shape, resists the action of various chemicals injurious to rubber, and possesses even greater flexing life than rubber. Known as "Koroseal," the new product is not expected to replace rubber in general use but will be applied in some instances where requirements demand rubbery consistency and flexibility, combined with resistance to certain oils and chemicals.

♦ ♦ ♦

Die Making Machine—Foley Mfg. Co. Inc., 11-15 Main street N. E., Minneapolis, is placing on the market a die making machine for sawing and filing dies in addition to performing other metalworking operations. Any type of saw can be used without delay of changing holding fixtures. Chucks are so constructed that they will hold any type of blade, no holes in the blade being necessary. Likewise standard or special files can be used without special holding fixtures.

Die making machine built by Foley Mfg. Co. Inc.

In the unit, shown herewith, four speeds are provided by step pulleys—95, 135, 185 and 400 revolutions per minute. Any angular change can be made without the use of wrenches or tools without enlarging the hole which is the pivotal center of the table. The ram also can be tilted right or left to any desired angle up to 20 degrees. This, combined with the adjustable table, permits cutting at any combination of angles. The ram has a gib adjustment for taking up wear. A blast of air from a pump in the machine keeps the work clean. Air is applied through a pipe which also serves as a hold-down in such a manner that air nozzles are not required. All hold-downs are quickly adjustable to any position.

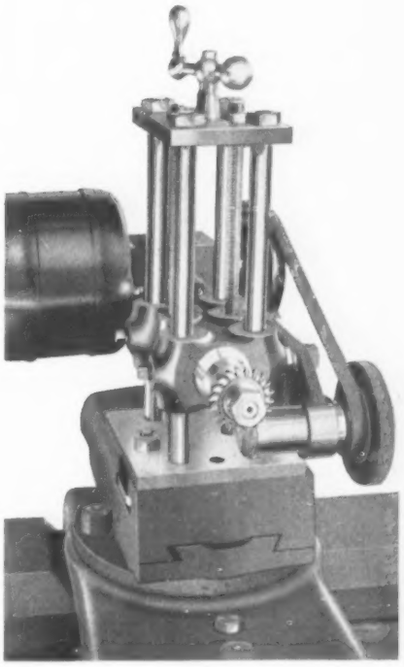
Capacity—6½-inch throat will saw to center of a 13-inch piece; also will saw and file 3-inch thick steel.

♦ ♦ ♦

Lathe Converter—Master Brake & Appliance Co. Inc., Trousdale, Kans., recently developed an attachment for a lathe which provides the full range of operations of the average milling machine. This attachment, shown herewith, fits any lathe, the manufacturer states, and is a combination machine in that it does grinding, broaching, drilling, etc.

It is not necessary to completely dismantle a lathe in order to convert it for use before proceeding with any of the operations. The operator need only remove tool post holder from T-slot of the compound rest, insert an adapter clamp supplied with the machine, tighten two nuts and the lathe is ready to be employed as a milling machine, a universal grinder or broaching machine.

As a grinding machine the converter embodies a new feature. In addition to internal and external grinding operations which include grinding at all angles within the range of the compound rest on the lathe, this converter is provided with an 11-inch range of vertical lead screw adjustment. The device also has a wide range of flexibility for broaching inside keyways, splines, gears, tapers, squares and angles.



Lathe converter manufactured by Master Brake & Appliance Co. Inc.

NRA

(*Concluded from Page* 11)

chinery and Equipment Dealers, 58 Water street, Pittsburgh, has been notified that the code for the used machinery and equipment distributing trade was signed on Jan. 10. Steps are now being taken to set up the code authority and obtain code compliance at the earliest possible moment.

BUDGETS SUBMITTED

Open steel flooring industry, $6250; reinforcing materials fabricating, $40,000.

Meetings

ANNUAL meeting of the American Steel & Wire Co.'s district sales managers will be held in Hotel Cleveland, Cleveland, Jan. 23 and 24. Speakers at the banquet Jan. 23 may include some United States Steel Corp. officials.

OPEN HEARTH MEETING SET

Next meeting of the open hearth committee of the American Institute of Mining and Metallurgical Engineers will be held April 11-12 at the Netherland Plaza hotel, Cincinnati. According to the committee's chairman, L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, O., present plans call for sessions on Thursday morning and Friday morning and afternoon and a visit to the plant of the Newport Rolling Mill Co. on Thursday afternoon.

400 AT "NATIONAL" NIGHT

Four hundred members attended the annual national presidents' night of the Chicago chapter of the American Society for Metals, Jan. 10. Speakers included B. F. Shepherd, national president; W. H. Eisenman, national secretary, and Robert Archer, national vice chairman.

Financial

GULF STATES STEEL CO., Gadsden, Ala., first integrated steel producer to report for 1934, experienced a net loss of $27,558, after charges, and including profit on debentures, compared with a net profit of $264,611 after similar charges in 1933. Fourth quarter loss was $44,468, against profit of $138,498 in the same quarter of 1933.

GIRDLER SEES LARGE DEMAND

Proxies received by Republic Steel Corp. for acquiring the Corrigan, McKinney Steel Co. and Truscon Steel Co. and a financial re-organization exceed the necessary two-thirds of the common stock and are within 7 per cent of the required assent of preferred stock. Said T. M. Girdler, president, last week:

"I am convinced by every evidence that America is again moving forward into a new cycle of greater achievement, greater production, and that the proposed merger equips Republic to play a highly important part in this new era."

ACME PROFIT LARGER

Acme Steel Co., Chicago, reports net profit of $1,031,116 for 1934, against a net of $941,795 in 1933.

¶Interlake Steamship Co., Cleveland, has purchased 34,443 of its common shares under the purchase plan announced to stockholders Dec. 5.

SHARON REDEEMING SCRIP

Sharon Steel Hoop Co., Sharon, Pa., has issued notice to bondholders of its scrip certificates that it has elected to exercise its option to redeem the series A certificates dated Feb. 1, 1933, payable Feb. 1, 1936, and bearing interest at 5½ per cent per annum. These were issued in partial payment of the interest coupons due Feb. 1, 1933.

¶Stockholders of the Williamsport Wire Rope Co., Williamsport, Pa., are presenting a plan of reorganization which continues the company as an independent organization. The company plan is being sponsored by Preston James Yeiser & Co. Inc., of New York, and an issue of new bonds underwritten by them is being resold to the United States Steel Corp.

Washington

RECONSTRUCTION FINANCE CORP. Jan. 14 liberalized its regulations governing direct loans to industry. Loans will be made both to pay existing indebtedness and for the purchase of additional machinery, the latter when an economic need is shown, the loan is adequately secured, evidence shows that at least 50 per cent of the loan can be amortized from earnings in five years, and the applicant has sufficient current operating assets to meet normal requirements.

Merger

IN REGARD to the proposed merger of two large steel producers in the Middle West, reported a week ago, nothing further has been established for publication beyond an admission that discussions have been held. If consummated, the merger would bring together a total of slightly more than 4,000,000 tons of ingot capacity, giving it fourth rank in size, after the United States Steel Corp., Bethlehem Steel Corp. and Republic Steel Corp.

Institute

OPPOSITION in the steel industry as well as among steel consumers to the proposed 30-hour week is reported by the American Iron and Steel institute.

Steel mill employes are reported opposed due to fear it will result in reduction in weekly earnings or in freezing them at existing levels.

Management is fearful that difficulties attendant upon a shorter week would be insurmountable and cause a contraction of markets.

Consumers view the measure as certain to make substantially higher prices. It is estimated that had the 30-hour law been operative last year the added direct labor cost of producing steel would have been over $100,000,000.

Because of large deficits indicated for last year, this added wage cost would have increased prices. An increase in costs also would have resulted from reduced efficiency in mill production; necessity for four-shifts in continuous operations; impracticability of applying 6-hour day in single shift operations; increased overhead costs and enhanced prices of raw materials.

Orders last year were only sufficient to provide three quarters of full time employment under the existing 40-hour maximum week, so that the average man put in only 29.7 hours per week. Had the 30-hour week been operative individual employes would have averaged no more than 20 hours.

The institute also emphasized that any further artificial addition steel producing costs would increase the disadvantage under which the industry now is operating, in comparison with foreign producers.

TOWER IS RE-ELECTED

Walter S. Tower, executive secretary of the institute since October, 1933, and the principal contact authority of the institute on the steel code, was re-elected secretary by directors, Jan. 17.

In announcing the reappointment of Mr. Tower the institute said: "Before joining the institute Mr. Tower was head of the commercial research department of the Bethlehem Steel Co." This, combined with the appointment of C. H. H. Weikel as manager of Bethlehem's commercial research and industrial development department (STEEL, Jan. 14, p. 17) indicates that Mr. Tower, who was originally loaned to the institute, has now severed all other ties.

Broader Demand for Steel Lifts Rate to 51

Pittsburgh, Chicago Production Up Sharply—Heavy Volume of Sheets, Strip, Bars, Wire—Structurals, Railroads Still Slow—Scrap Index Continues Rise

A 5½-POINT rise to 51 per cent in steelworks operations last week was accompanied by a broadening in the base for iron and steel demand.

Most significant was the advance of 6 points to 33 per cent in the Pittsburgh district rate, responsive to greater diversity in requirements; two more blast furnaces in that district being 'ighted, and six additional scheduled within the ext ten days.

Chicago, which also reflected the general expansion, was up 7 points to 56 per cent. Detroit, representing further gains in automobile specifications, advanced 12 points to 71 per cent. The Wheeling district was up 6 to 90 per cent; Youngstown 4 to 60; Buffalo 3 to 42; eastern Pennsylvania 1½ to 27½. Cleveland held at 82; New England 68, while Birmingham, lacking heavy finished steel tonnage, was down 4½ to 29.

The volume of sheet, strip and wire business is comparable to that early in 1929, sheet mills being unable to make deliveries of full finished automobile material for four to six weeks. Pittsburgh producers are booking 5000 to 6000 tons of steel bars daily. Tractor and implement production is making fully as good a recovery as automobiles. The tin plate industry is operating at 65 per cent, with orders from canmakers outrunning production.

Ingot Production 25 Per Cent Above 1934 Average, with Railroads, Structurals Lagging

Some improvement is apparent in practically all important groups except structurals and railroads. Since the first of the year ingots have been produced at a rate 25 per cent higher than the average for 1934, indicating that unless reinforced soon with tonnage from these two major consumers, steelworks operations are nearing a peak.

Retail automobile sales now are limited only by manufacturers' ability to produce. The industry's schedules are being geared up for an output of at least 275,000 units this month, and 1,000,000 in the first quarter. Last week 67,000 cars were made, compared with 59,700 in the preceding week. The late start with new models is making it difficult for manufacturers to accumulate material beyond immediate requirements.

Rail tonnage is coming out slowly. Norfolk & Western has distributed 32,000 tons of rails and 12,000 tons of fastenings, while Louisville & Nashville has awarded 15,000 tons of rails. The Carnegie Steel Co.'s rail mills at Braddock, Pa., will resume operations this week. Southern Pacific is asking bids on 26,740 tons of rails and fastenings; St. Louis-San Francisco is expected to buy 13,000 tons of rails, and New York Central 20,000 tons. The latter is to air condition 182 cars, the Northern Pacific 60.

Shape awards for the week, amounting to 14,222 tons and comparing with 9246 tons in the preceding week, include 5100 tons for the Guttenberg, Iowa, dam. United States engineers are seeking an apropriation of $35,000,000 for additional dams in the Mississippi river. Inquiries are out for 44 barges a Pittsburgh, which may develop demand for 10,000 tons of plates, and 4000 tons of plates are about to be awarded for the Grand Coulee, Wash., dam.

Scrap Prices up 50 Cents at Pittsburgh and In East; Easier at Chicago; More Purchasing

Heavier scrap purchases are being made. Pittsburgh and eastern prices are up 50 cents, while at Chicago the market has reacted, with a loss of 50 cents per ton. National Tube Co. has bought 40,000 tons for its Lorain, O., plant. The market for pig iron continues strong.

STEEL's London cablegram reports December pig iron production in Great Britain as 513,500 tons, daily average 1.2 per cent higher than in November. Steel ingot output was 654,000 tons; daily, 14 per cent below November. British iron and steel imports last month increased 10 per cent; exports declined 15 per cent.

While Russia continues to hold off large purchases of equipment and materials in the United States, awaiting favorable credit terms, it has distributed some small to moderate size orders for equipment, paying cash. Washington looks for some important developments in Russian buying soon.

STEEL's iron and steel price composite is up 5 cents to $32.62, due to the rise in scrap; the finished steel index remains $54, while the scrap composite has advanced 17 cents to $12.25.

COMPOSITE MARKET AVERAGES

	Jan. 19	Jan. 12	Jan. 5	One Month Ago Dec., 1934	Three Months Ago Oct., 1934	One Year Ago Jan., 1934	Five Years Ago Jan., 1930
Iron and Steel	$32.62	$32.57	$32.51	$32.39	$32.10	$31.15	$35.19
Finished Steel	54.00	54.00	54.00	54.00	54.00	51.10	55.63
Steelworks Scrap	12.25	12.08	11.71	11.02	9.40	11.24	14.16

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip and cast iron pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Jan. 19, 1935	Dec. 1934	Oct. 1934	Jan. 1934
Finished Material				
Steel bars, Pittsburgh	1.80	1.80	1.80	1.75
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$28.00	28.00	28.00	26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00

	Jan. 19, 1935	Dec. 1934	Oct. 1934	Jan. 1934
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.76	19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	18.76
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2 foundry, Chicago	18.50	18.50	18.50	17.50
Southern No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	19.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	24.04	24.04	23.54	23.54
Gray forge, del. Pittsburgh	18.63	18.63	18.80	18.38
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	90.24
Scrap				
Heavy melting steel, Pittsburgh	$13.75	12.95	10.50	13.05
Heavy melt. steel, No. 2, east. Pa.	10.25	9.30	8.00	9.40
Heavy melting steel, Chicago	12.25	10.55	8.75	10.45
Rails for rolling, Chicago	13.25	11.65	8.90	11.25
Railroad steel specialties, Chicago	13.75	11.90	9.75	11.30
Coke				
Connellsville, furnace, ovens	3.60	3.60	3.60	3.60
Connellsville foundry, ovens	4.60	4.60	4.60	4.25
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.85c
Gary, base	1.95c
Chicago, del.	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham, base	2.00c
St. Louis, del	2.17c
F.o.b. cars, dock, Pacific ports	2.40c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.40c
Gary, base	2.50c
Chicago, del.	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del.	2.72c
F.o.b. cars, dock, Pacific ports	3.05c

GALVANIZED No. 24

Pittsburgh, base	3.10c
Gary, base	3.20c
Chicago, del.	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham, base	3.25c
St. Louis, del.	3.42c
San Fran'co, f.o.b. cars, dock	3.70c

TIN MILL BLACK No. 28

Pittsburgh, base	2.75c
Gary, base	2.85c
St. Louis, del.	3.07c

COLD ROLLED No. 10

Pittsburgh, base	2.50c
Gary, base	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
F.o.b. cars, dock, Pacific ports	3.10c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, base	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

ENAMELING SHEETS

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher.

Tin plate, coke base contract	$5.25
Do., waste waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat Resistant Alloys

Pittsburgh, base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh, base	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, del.	2.20c
Buffalo, del.	2.03½c
Chi. or Gary base	1.85c
Cleveland, del.	1.98½c
Birmingham, base	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific Coast, f.o.b. cars, dock	2.35c
St. Louis, del.	2.07c

Structural Shapes

Pittsburgh, base	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
Boston, del.	2.18½c
Bethlehem, base	1.90c
Chicago, base	1.85c
Cleveland, del.	1.98½c
Buffalo, base	1.90c
Gulf ports	2.20c
Birmingham, base	1.95c
Pacific Coast, f.o.b. cars, dock	2.35c

Bars

SOFT STEEL

Pittsburgh, base	1.80c
Chicago or Gary	1.85c
Duluth, base	1.95c
Birmingham, base	1.95c
Cleveland, base	1.85c
Buffalo	1.90c
Detroit, del.	1.95c
Pacific Coast ports cars, dock, c.i.f.	2.35c
Philadelphia, del.	2.09c
Boston, del.	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

RAIL STEEL
To Manufacturing Trade

Pittsburgh, base	1.70c
Chicago or Gary, base	1.75c
Moline, Ill., base	1.75c
Cleveland, base	1.75c
Buffalo, base	1.80c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia, base	1.89c
Pittsburgh, refined	2.75-7.50c

REINFORCING

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pitts.-Cleve. 100 lb. keg

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot) □

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo 0.50

4600 0.20 to 0.30 Mo. 1.25 1.75 Ni. 1.05

5100 0.80-1.10 Cr 0.45

5100 Cr. spring base

6100 bars 1.20

6100 spring 0.70

Cr., Ni., Van 1.50

Carbon Van. 0.95

$250....Carbon base plus extras

Piling □ □

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops □

Hot strip to 23⅝-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base,	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails billet qual, Pitts., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70-10-10 off
Rolled thread, ½ x 6 and smaller	70-10-10 off

MACHINE BOLTS

All sizes, cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts,	70-10-10 off
Tire bolts	60-10 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch	
Rolled thread machine bolts, ½ x 6 and smaller	70-10-10 off
Step bolts	70-10 off
Elevator bolts	70-10 off

NUTS

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-10 off
Do., ½ to 1-inch	70-10-10 off
Do., over 1-inch	70-10 off

HEXAGON CAP SCREWS

Milled	85 off
Upset, 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in. small	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.25 off

Cut Nails □ □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

In.	Steel Blk.	Steel Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

	Steel	
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

	Steel
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	
⅛—1½ inch, black and galv.	take 4 pts, over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel □

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O., and Sparrows Point, Md.	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville, fur.	$3.60- 3.85
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry	4.45- 5.25
Wise county fur.	4.00- 4.50

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	15.00c
90 per cent benzol	15.00c
Toluol	30.00c
Solvent naphtha	26.00c
Commercial xylol	26.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

*Naphthalene flakes and balls, in bbl.	5.25c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25; 50-cent differentials apply to any grade below 1.75. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmgham.	21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham,	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem.	20.89	21.39	.....	.....
Philadelphia from Birmingham.	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point:

Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base, 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore □ □

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbes.	4.65

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.,	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos...	9.50
Spanish No. Africa basic, 50 to 60%....	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%.....	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-18.50

Manganese Ore □

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%..	26.00
So. African, 52%.....	26.00
So. Afr., 49-51%.....	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works.

FIRE CLAY BRICK

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00
Second Quality	
Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00
Ohio	
First quality	$40.00
Intermediary	36.00
Second quality	25.00
MALLEABLE BUNG BRICK	
All bases	50.00
SILICA BRICK	
Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00
MAGNESITE	
Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	40.00
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash.	22.00
BASIC BRICK	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5 □ □

Washed gravel, duty paid, tide, net ton	$19.50
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$15.50-16.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. fur. spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent Spot, $5 a ton higher.	126-130.00
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%, 105.00	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.89

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.09
Lead, cut, to jobbers	7.25
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

Old Metals □ □

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.37½-4.62½
Chicago	4.37½-4.62½
Cleveland	4.75- 5.00
St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	5.75- 6.00
Chicago, No. 1	5.50- 5.75
Cleveland	5.25- 5.50
St. Louis	5.50- 5.65
Composition Brass Borings	
New York	3.87½-4.12½
Light Copper	
New York	4.50- 4.75
Chicago	4.25- 4.50
Cleveland	4.50- 4.75
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.25- 2.50
Cleveland	2.50- 2.75
Lead	
New York	2.75- 2.85
Cleveland	2.75- 3.00
*Chicago	2.75- 3.00
St. Louis	2.75- 2.90
Zinc	
New York	1.75- 2.00
Cleveland	1.75- 2.00
St. Louis	2.40- 2.50
Aluminum	
Borings, Cleveland	7.50- 8.00
Mixed, cast, Clev.	12.25-12.75
Mixed, cast, St. L.	12.00-12.50
Clips, soft, Clev.	13.50-14.00

Secondary Metals □

Brass ingot, 85-5-5-5	8.25
*Stand. No. 12 Alum.	16.00-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.00- 9.50
Boston, dock, expt.	9.00- 9.25
Boston, domestic	6.75- 7.25
Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.25-10.75
Chicago, No. 1	12.00-12.50
Cleveland, No. 1	11.00-11 50
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	9.50-10.00
Detroit, No. 2	8.50- 9.00
Eastern Pa., No. 1	11.50-12.00
Eastern Pa., No. 2	10.00-10.50
Federal, Ill.	8.50- 9.00
Granite City, R. R.	9.50-10.00
Granite City, No. 2	7.50- 8.00
N. Y., deal. No. 2	7.00- 7.25
N. Y., deal. R. R.	8.50- 8.75
Pittsburgh, No. 1	13.50-14.00
St. Louis	8.00- 8.50
Valleys, No. 1	13.00-13.50

COMPRESSED SHEETS

Buffalo, dealers	10.25-10.75
Chicago, factory	11.50-12.00
Chicago, dealer	10.50-11.00
Cleveland	11.00-11.50
Detroit	10.00-10.50
E. Pa., new mat.	10 00-10.50
Pittsburgh	13.50-14.00
St. Louis	7.00- 7.50
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	7.50- 8.00
Cincinnati, del.	7.00- 7.50
Cleveland	8.50- 9.00
Pittsburgh	12.00-12.50
St. Louis	5.00- 5.50

SHEET CLIPPINGS, LOOSE

Chicago	6.00- 6.50
Cincinnati	6.50- 7.00
Detroit	5.00- 5.50
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	13.00-13.50
Chicago (3 ft.)	13.50-14.00
Chicago (2 ft.)	14.50-15.00
Cincinnati, del.	12.50-13.00
Detroit	12.00-12.50
Pitts., open-hearth, 3 ft. and less	15.50-16.00
St. Louis, 2 ft. & less	12.50-13.00

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	12.00-12.50
Pittsburgh	14.50-15.00

STOVE PLATE

Birmingham	6.00- 6.50
Boston, dealers	3.25- 3.75
Buffalo	9.25- 9.75
Chicago, net	7.00- 7.50
Cincinnati, dealers	6.50- 7.00
Detroit, net	6.00- 6.50
Eastern Pa.	9.00
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	13.00-13.50
Chicago, springs	13.50-14.00
Eastern Pa.	14.50
Pittsburgh	15.50-16.00
St. Louis	10.50-11.00

ANGLE BARS—STEEL

Chicago	13.00-13.50
St. Louis	11.00-11.50

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	13.00-13.50
Cleveland, billet, bloom crops	15.00-15.50
Eastern Pa., crops	15.00-15.50
Pittsburgh, billet, bloom crops	15.50-16.00
Pittsburgh, sheet bar crops	14.50-15.00

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	10.50-11.00

SHOVELING STEEL

Chicago	12.00-12.50
Federal, Ill.	8.50- 9.00
Granite City, Ill.	7.50- 8.00

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	11.50-12.00
Chicago, No. 1, net	11.00-11.50
Chicago, No. 2	12.00-12.50
Cincinnati, No. 2	9.00- 9.50
Eastern Pa.	11.50-12.00
N. Y., No. 1, deal.	7.00- 7.50
St. Louis, No. 1	7.00- 7.50
St. Louis, No. 2	9.75-10.25

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.50-10.00
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.25-10.75
Chicago, No. 1	10.50-11.00
Cinci., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	3.50- 4.00
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1, new	8.50- 9.00
Valleys, new, No. 1	12.50-13.00

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	3.00- 3.25
Buffalo	5.50- 6.00
Chicago	6.50- 7.00
Cincinnati, dealers	4.50- 5.00
Cleveland	7.50- 8.00
Detroit	5.50- 6.00
Eastern Pa.	6.50- 7.00
New York, dealers	3.00- 3.50
Pittsburgh	9.25- 9.75
St. Louis	3.50- 4.00
Valleys	9.75-10.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	6.50- 7.00
Cincinnati, dealers	4.50- 5.00
Cleveland	7.50- 8.00
Detroit	5.75- 6.25
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.75- 7.25

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	6.50- 7.00
Chicago	6.50- 7.00
Cincinnati, dealers	4.00- 4.50
Cleveland	7.50- 8.00
Detroit	5.75- 6.25
E. Pa., chemical	12.00-13.00
New York, dealers	1.50- 1.75
Pittsburgh	6.75- 7.25
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	5.50- 6.00

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.25- 6.75
Cincinnati	5.50- 6.00
Eastern Pa.	9.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	6.00- 6.25
Buffalo	10.00-10.50
Cleveland	9.50-10.00
Detroit	8.00- 8.50

FORGE SCRAP

Boston, dealers	5.00- 5.25
Chicago, heavy	13.50-14.00
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	12.25-12.75

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.00- 7.50
Chicago, elec. fur.	11.00-11.50
Cleveland	7.50- 8.00
Eastern Pa.	9.50-10.00
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.50-13.00
Boston, ship. point.	10.00-10.50
Buffalo	13.00-13.50
Chicago, net	16.50-17.00
Eastern Pa.	16.50-17.00
St. Louis	14.00-14.50

SHAFTING

Boston, ship. point.	12.25-12.50
Eastern Pa.	17.00
New York, dealers	10.75-11.25
St. Louis	11.50-12.00

CAR WHEELS

Birmingham	9.00- 9.50
Boston, iron deal.	6.00- 6.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.50-13.00
Chicago, iron	12.00-12.50
Chicago, rolled steel	13.50-14.00
Cincinnati, iron	9.00- 9.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	14.50
Pittsburgh, iron	12.50-13.00
Pittsburgh, steel	15.50-16.00
St. Louis, iron	8.75- 9.25
St. Louis, steel	10.50-11.00

No. 1 CAST SCRAP

Birmingham	9.50-10.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.50-11.00
Buffalo, mach.	12.00-12.50
Chicago, agri. net	9.50-10.00
Chicago, auto	11.00-11.50
Chicago, mach. net	11.50-12.00
Chicago, railr'd net	10.50-11.00
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	12.50-13.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.50-12.50
Pittsburgh, cupola	13.50-14.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	9.00- 9.50
St. L., No. 1 mach.	10.25-10.75

HEAVY CAST

Boston, del.	6.00- 6.25
Buffalo, break.	9.00- 9.50
Cleveland, break.	9.00- 9.50
Detroit, auto net	10.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.50
N. Y. break. deal.	6.50- 6.75
Pittsburgh	12.50-13.00

MALLEABLE

Boston, consum.	10.00-10.50
Buffalo	12.50-13.00
Chicago, R. R.	14.00-14.50
Cincinnati, agri. del.	9.00- 9.50
Cleveland, rail	12.00-12.50
Detroit, auto	11.00-11.50
St. Louis, R. R.	10.50-11.00
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.00-10.50
Boston, dealers	8.00- 8.50
Buffalo	11.50-12.00
Chicago	13.00-13.50
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.75-11.25

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	10.00-10.50

LOW PHOS. PUNCHINGS

Buffalo	13.00-13.50
Chicago	14.00-14.50
Eastern Pa.	14.50-15.00
Pittsburgh	15.00-15.50

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: N. Y.	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Jan. 12	9.00	9.12½	7.50	51.05	50.90	3.70	3.55	3.75	*19.00	14.50	35.00
Jan. 14	9.00	9.12½	7.50	50.67½	50.55	3.70	3.55	3.75	*19.00	14.50	35.00
Jan. 15	9.00	9.12½	7.50	50.50	50.37½	3.70	3.55	3.75	*19.00	14.50	35.00
Jan. 16	9.00	9.12½	7.50	50.65	50.50	3.70	3.55	3.75	*19.00	14.50	35.00
Jan. 17	9.00	9.12½	7.50	50.85	50.50	3.70	3.55	3.75	*19.00	14.50	35.00
Jan. 18	9.00	9.12½	7.50	51.00	50.62½	3.70	3.55	3.75	*19.00	14.50	35.00

*Nominal range 19.00c to 21.00c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland(c)	1.97½c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	3.90c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	2.90c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, 3/16-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.45c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†...	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅞-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
Milwaukee	3.41c
New Orleans	3.59c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
Milwaukee	3.41c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c
COLD. FIN. STEEL	
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
Milwaukee	3.61c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle(f) (d)	4.75c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs. extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Jan. 17

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.01 3 1 6	$13.78	1 14 0
Basic bessemer	13.42 2 15 0*	12.97	1 12 0
Hematite, Phos. .03-.05	15.25 3 2 6	.....	.....
SEMIFINISHED STEEL			
Billets	$26.84 5 10 0	$19.04	2 7 0
Wire rods, No. 5 gage	38.06 7 16 0	36.49	4 10 0
FINISHED STEEL			
Standard rails	$37.82 7 15 0	$44.60	5 10 0
Merchant bars	1.63c 7 10 0	1.15c to 1.20c	3 2 6 to 3 5 0
Structural shapes	1.60c 7 7 6	1.13c	3 1 6
Plates, †¼ in. or 5 mm.	1.74c 8 0 0	1.51c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.01c 9 5 0	2.13c	5 16 0
Sheets, gal., 24 gage, corr.	2.44c 11 5 0	2.38c	6 10 0
Bands and strips	1.84c 8 10 0	1.46c	4 0 0
Plain wire, base	2.01c 9 5 0	1.96c	5 7 6
Galvanized wire, base	2.44c 11 5 0	2.30c to 2.33c	6 5 6 to 6 7 6
Wire nails, base	2.60c 12 0 0	2.11c	5 15 0
Tin plate, box 108 lbs.	$ 4.39 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.47	3 7 6(a)	$13.80	210	$14.45	310	$25.33	63
Basic bessemer pig iron	16.47	3 7 6(a)*	12.15	185	13.05	280	27.83	69.50†
Furnace coke	4.27	0 17 6	7.88	120	5.12	110	7.61	19
Billets	26.84	5 10 0	28.25	430	20.50	440	38.64	96.50
Standard rails	1.79c	8 5 0	2.08c	694	2.31c	1,100	2.40c	132
Merchant bars	1.87c	8 12 0	1.68c	560	1.16c	550	2.00c	110
Structural shapes	1.90c	8 15 0	1.65c	550	1.16c	550	1.96c	107.50
Plates, †¼-in. or 5 mm.	1.97c	9 1 3	2.10c	700	1.47c	700	2.31c	127
Sheets, black	2.28c	10 10 0§	2.55c	850‡	1.63c	775‡	2.62c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.82c	13 0 0	4.50c	1,500	3.15c	1,500	6.73c	370
Plain wire	2.01c	9 5 0	3.15c	1,050	2.31c	1,100	3.15c	173
Bands and strips	2.03c	9 7 0	1.95c	650	1.47c	700	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. 24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b hematite.

**Gold pound sterling carries a premium of 66.47 per cent over paper sterling.

Bars

Bar Prices, Page 44

Chicago—Improvement in steel bar demand is more diversified and although specifications from the automotive industry and farm implement manufacturers still predominate, buying elsewhere is in substantial volume. Orders principally are for prompt shipment. Activity in forging bars is improving.

Pittsburgh—Soft steel bar specifications continue to make headway with the result that through last week producers in this district were able to book new business in aggregate at the rate of 5000 to 6000 tons daily. An encouraging demand for small structural shapes, sold on the soft steel bar card, is also evident. Carbon bars are quoted at 1.80c, Pittsburgh, and alloy bars, 2.45c, Pittsburgh.

Cleveland—Steel bar tonnage booked in January exceeds that for the entire month of December, with approximately 75 per cent of the output going to automobile manufacturers. Some sellers note a lighter volume of specifications from agricultural implement manufacturers after several weeks active buying. Small orders are more frequent from a wide variety of consumers, including builders of excavating machinery.

Boston — Slight increase in specifications for commercial steel bars is the result of broader demand, rather than notable improvement in any one or group of consumer outlets. For the manufacture of 1-inch die-lock chain cable at the Boston navy yard, bids are in on 154,000 pounds of hot-rolled nickel steel bars, commercial lengths.

Philadelphia—With railroads and ship yards specifying lightly, the movement of commercial steel bars is small, although generally better than in the closing months of last year. The market is 1.80c, Pittsburgh, or 2.09c, Philadelphia.

New York—Demand for steel bars is more active from railroads and shipyards for repair work and railroad accessory manufacturers are also specifying more freely.

Plates

Plate Prices, Page 44

Cleveland—While good size tonnages are lacking, the market is more active in requirements for small fabricators. Orders are restricted to carload lots or less, and quickly delivery is wanted in nearly every instance, some sellers losing business because of inability to ship immediately. A few consumers who have not been in the market for three or four months made purchases last week.

Pittsburgh—Prospective barge buyers are now circulating inquiries for at least 44 units of floating equipment, but three-fourths are being withheld from actual purchase by financing difficulties. This would require upwards of 10,000 tons of plates and structural shapes, mainly the former. West Kentucky Coal Co., Paducah, Ky., which had until Jan. 15 to exercise its option to buy three more standard coal barges additional to seven placed with Marietta Mfg. Co., Point Pleasant, W. Va., has not closed. Plates continue firm at 1.80c, base Pittsburgh. Chief of army engineers at Washington opens bids Feb. 6 for two 100 x 30 x 6-foot steel barges.

Chicago—Plate demand is fairly steady. About 4000 tons of plates will be required for penstocks for the Grand Coulee, Wash., dam for which bids are to be asked soon. Evanston, Ill., has placed a water tank requiring 510 tons. General American Transportation Corp. plans to increase terminal facilities at New York and Corpus Christi, Tex., and will build a new one at Houston, Tex. This work will require the addition of numerous tanks.

Philadelphia—While plate sales are gaining in some directions, it continues sluggish in others, with little net improvement. A bright spot is better demand from manufacturers of range boilers, hot water heaters, and gasoline filling station equipment. No action has yet been taken on the ferryboat and barges previously noted as pending. The navy will open bids Jan. 25 on plates, shapes and sheets. Railroad buying continues negligible. The market is steady at 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia.

Seattle — About 4000 tons of plates are involved in a pipe line for Tacoma's Green river extension program. Bids will be received Jan. 31 by A. M. Angove, chief clerk, Tacoma, Wash. The work calls for nearly nine miles of pipe, estimated at $600,000, and 240 calender days are allowed.

San Francisco—No awards of importance were reported placed, and pending business is not heavy. On the second unit of the Los Angeles aqueduct, Morrison-Knudsen Co. was low by over $100,000 on a concrete pipe basis, and it is thought the metropolitan water district will decide on concrete pipe rather than on 4100 tons of welded steel pipe. Los Angeles also has cancelled an inquiry for 63,000 feet of welded steel pipe for the water and power department, requiring 4000 tons of plates.

New York—Plate tonnage continues to expand moderately although few important tonnages are noted. A steel pipe line being figured here requires 200 tons of plates.

Contracts Placed

510 tons, 1,000,000-gallon elevated tank, Evanston, Ill., to Chicago Bridge & Iron Works, Chicago.

280 tons, water tank, Tampa, Fla., to Chicago Bridge & Iron Works, Chicago.

250 tons, two standpipes, Jamaica Water Supply Co., Jamaica, N. Y., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

4100 tons, second unit of aqueduct, metropolitan water district, Los Angeles; Morrison-Knudsen Co., low on general contract on concrete pipe basis.

4000 tons, 63,000 feet welded pipe for water and power department, Los Angeles, specification 1588; bids cancelled and new bids to be taken later.

4000 tons, 42 and 54-inch, ⅜ and ⅝-inch, for nine miles of water mains, Green river extension; bids at Tacoma, Wash., Jan. 31.

4000 tons, penstocks, Grand Coulee, Wash., dam; bids soon.

1500 tons, San Francisco bay crossing, Hetch Hetchy pipe line; bids about Feb. 1.

800 tons, No. 10 gage, pipe line, Eureka, Calif.; bids about Feb. 15.

153 tons, 250,000 gallon tank, Torrance, Calif.; no bids received and new bids to be called for soon.

135 tons, specification No. M-2036, bids No. 31001, metropolitan water district, Los Angeles; bids opened.

Unstated tonnage, tanks, General American Tank Storage & Terminal Co., New York, Corpus Christi and Houston, Tex.

Sheets

Sheet Prices, Page 44

Pittsburgh—On many grades of full-finished sheet producers have been accepting orders from automobile companies which they will be unable to deliver for four or five weeks. A diversification of orders is noted, although galvanized is in an off season.

Chicago—Sheet demand continues to broaden steadily with best activity prevailing in cold-finished material on which delivery of four to six weeks is required by mills. On other

descriptions fairly prompt shipment can be made. Sheet requirements of miscellaneous users are somewhat spotty but are increasing steadily. Farm implement manufacturers are increasing their operations and sheet needs.

Cleveland — Despite increasing production, sheet mills are falling farther behind in deliveries to automobile manufacturers. Specifications have banked up so that some mills cannot give delivery for four weeks, and generally deep drawing material cannot be shipped for five or six weeks from date of order. Sheet producers say automobile builders delayed too long in getting started with new models; retailers are unable to obtain sufficient number of cars at this time. Sheet mills here and in an adjacent lake district are operating at capacity. Demand from electrical equipment manufacturers is strong.

Philadelphia—Further substantial buying of autobody tonnage is noted; also a belated improvement in demand from manufacturers of range boilers and gasoline filling station equipment. The Kahl-Holt, Baltimore, has received a contract for more than 300 tons of autobody seconds from the state of Maryland for its 1936 automobile license tag requirements. The sheets will be supplied by the Eastern Rolling Mill Co., Baltimore. Bureau of supplies and accounts, navy department Washington, will open bids Jan. 25 on 1250 tons of sheets.

Buffalo—Buffalo district sheet mills have increased their output to 60 per cent, highest since last spring, due to automotive demand.

Birmingham, Ala.—Sheet mills continue a fairly good schedule of operations. Inquiries are more numerous.

New York—A fair volume of sheets is moving here, although some sellers report little improvement over the corresponding period a month ago. Some difficulty is being encountered on deliveries of certain sizes as a result of heavy demand in the Middle West from the automobile industry. Bids will be opened Jan. 25 at Washington on approximately 120 tons of sheets for the Brooklyn, N. Y., navy yard. This is included in approximately 1250 tons on which bids are to be opened that day for the various navy yards. Prices are steady.

Bennett Mfg. Co., Alden, N. Y., has been tentatively awarded 750 tons of license tag stock for New York, with material to be supplied by an Ohio producer. Approximately 450 tons are to be purchased by the state later.

Boston—Sheet orders are not being placed in the volume expected, although there has been some improvement. Small tank and container demand is light. Jobbers have been slow to release shipments.

Connecticut has awarded approximately 200 tons of automobile license tag stock to the American Sheet & Tin Plate Co.

Washington—Bids close Jan. 25 on 1235 tons of galvanized and black sheets, bureau of supplies and accounts, navy department. Mare Island, Calif., is the delivery point for the largest volume, 378 tons, but delivery also is asked for Boston, Philadelphia, Brooklyn, Puget Sound, Sewells Point, Charleston, Portsmouth, Norfolk, Washington and Great Lakes station.

Cincinnati — Demand from automobile manufacturers for full-finished sheets is keeping mills operating near capacity.

Transportation

Track Material Prices, Page 45

Placing of 32,000 tons of 131-pound rails by the Norfolk & Western is the high spot in the transportation market. Carnegie Steel Co., Pittsburgh, booked 24,000 tons and Bethlehem Steel Co., Bethlehem, Pa., 8000 tons. Tie plates and rail anchors to the extent of about 12,000 tons have been distributed as shown below.

Louisville & Nashville has placed 15,000 tons of 100-pound rails with the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. The rail order will be followed by accessories. Delivery will be during first quarter.

An order for 5000 tons of standard steel rails is said to have been placed in the East by an important carrier.

Norfolk & Western has been given permission by the interstate commerce commission to build an extension of 39½ miles in Buchanan county, Va., which will require additional rails and track fastenings.

Among prospective rail tonnages are 13,000 for the St. Louis & San Francisco, and 15,000 tons for the Chicago, Burlington & Quincy, 20,000 tons for the New York Central and 26,740 tons for the Southern Pacific.

New York Central plans as shown in a report to the interstate commerce commission, to spend $287,200 for air conditioning 182 passenger cars this year.

Baltimore & Ohio is reported to be inquiring for 50 to 150 cement cars. Chicago, Burlington & Quincy is understood to have placed five lightweight steel hoppers with Pressed Steel Car Co., Pittsburgh.

Brooklyn-Manhattan Transit Corp., New York, will inquire shortly for 40 subway cars.

Rail Orders Placed

Norfolk & Western, 32,000 tons of rails and 12,000 tons of tie plates and other accessories placed, 24,000 tons of rails to Carnegie Steel Co., Pittsburgh, and 8000 to Bethlehem Steel Co., Bethlehem, Pa.; 12,000 tons tie plates were distributed among these companies and the Wheeling Steel Corp., Wheeling, W. Va.; Weirton Steel Co., Weirton, W. Va.; and Republic Steel Corp., Youngstown, O.

Louisville & Nashville, 15,000 tons, 100-pound, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Buses Placed

Burlington Transportation Co., care Chicago, Burlington & Quincy, Chicago, 10 streamlined motor coaches to, General Motors Corp., Detroit.

Carolina Coach Co., Raleigh, N. C., four intercity buses, to White Motor Co., Cleveland.

Florida Motor Lines, Jacksonville, Fla., 10 intercity buses, to White Motor Co., Cleveland.

Manhattan Transit Co., Clifton, N. J., four White intercity coaches, to White Motor Co., Cleveland.

Monumental Lines Inc., Alexandria, Va., five White city coaches, to White Motor Co., Cleveland.

National City Bus Lines Inc., New York, four Indiana city coaches, to White Motor Co., Cleveland.

New Orleans Public Service Inc., New Orleans, 12 Indiana city coaches, to White Motor Co., Cleveland.

South Pennsylvania Bus Co., Philadelphia, five city coaches, to White Motor Co., Cleveland.

Southern Greyhound Lines, Louisville, Ky., five intercity buses, to White Motor Co., Cleveland.

Union Bus Co., Jacksonville, Fla., five intercity buses, to White Motor Co., Cleveland.

Wire

Wire Prices, Page 45

Pittsburgh — Wire products for manufacturers continue to reflect expanding demand, and many jobbers are beginning to balance stocks. In carload lots, Pittsburgh base, the market remains quoted 2.30c on plain wire and 2.90c on high carbon spring wire. Merchant wire items are still $2.60 per keg for nails, with polished staples 3.30c, and galvanized nails, 4.60c for 15 gage and coarser.

Copperweld Steel Co., Glassport, Pa., is fabricating approximately

100,000 copper-bearing wire-mat fabrics for the Memphis, Tenn., engineers, to be used in Mississippi river bank revetment. American Steel & Wire Co., Chicago, was recently awarded contract to furnish 1,600,000 square feet of galvanized welded wire screens for similar work by the army engineers at New Orleans.

Cleveland—Most of the improvement in wire demand is traceable to increased automobile production, substantial orders coming from makers of springs and nuts and bolts. In some instances mills have lost orders for wire and wire rods due to the fact that they have been unable to give prompt shipment.

Chicago—Wire demand has expanded substantially and activity is highest for this period in at least five years. Heavier orders are appearing from a diversified list of consumers although automotive needs still lead. While manufacturers' wire has experienced the sharpest upturn, jobbers are buying more liberally. Orders invariably are for prompt shipment and in some instances rush delivery is asked.

Philadelphia—Dullness has prevailed in wire products since the first of the year. As jobbers' stocks are large, producers look for little increase in that direction before Spring.

Boston—Increased buying is noted in wire specialties with active automotive and accessory demand stressing delivery. Finishing operations are heavier.

Pipe

Pipe Prices, Page 59

Chicago—Cast iron pipe orders and inquiries are light. The season is restricting work among municipalities in northern states and most pending PWA projects are delayed. A feature of recent business has been the appearance of several rush orders from manufacturing plants for small lots of cast pipe. The sanitary district program in Chicago eventually will require a fairly substantial pipe tonnage. Laying of a gas pipe line from central Michigan to Lansing, Flint and Detroit is proposed in a petition filed with the Michigan public utilities commission by the Michigan Gas & Electric Co., a newly formed company. The work would involve $5,000,000.

New York—Cast pipe buying is light but inquiries from the city are expected shortly for heavy tonnage. Bids close on Jan. 25 on 550 tons for a sewer at Freeport, N. Y., with alternates on steel pipe. A Brooklyn, N. Y., sewer, taking 800 tons of 30-inch cast pipe is as yet unplaced.

Cleveland—A fair demand for steel pipe for general maintenance work is noted, there being little new construction. Practically all these sales currently are through jobbers.

Pittsburgh—Diversification in orders for tubular products is a feature of the market and buying is on the upgrade. All pipe discounts are unchanged.

Seattle—The largest job pending in this district involves 300 tons of cast pipe for Redmond, Oreg. Seattle has purchased 1000 feet of 8-inch reconditioned cast pipe from the Pacific Water Works Supply Co., Seattle. Immediate demand for cast pipe is slow but the potential market is only awaiting financing by municipalities.

San Francisco — Muncipalities have shown little interest, so far, in the cast iron pipe market and as a result both bookings and inquiries involve relatively small lots. Distributors of standard steel pipe are of the opinion that first quarter shipments from stock will be the largest in several years.

Birmingham, Ala. — Numerous PWA projects have been taking more cast iron pressure pipe and accessories and production has been increased.

Cast Pipe Placed

100 tons, Reading, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 8-inch, Bangor, Me., to R. D. Wood & Co., Philadelphia.

Steel Pipe Placed

600 tons, mainly 3-inch, Tygarts reservoir dam, Grafton, W. Va., to National Tube Co., Pittsburgh, through Frederick Snare Corp.

Cast Pipe Pending

550 tons, 30-inch and under, sewer, Freeport, N. Y.; bids Jan. 25.

400 tons, 30-inch, Washington; bids Jan. 23.

300 tons, 2, 4 and 6-inch, Dallas Center, Iowa.

300 tons, Hammond, Ind., filter plant; E. W. Bachrach Co., Kansas City, Mo., general contractor.

300 tons, 6, 12 and 14-inch, alternate bids for wood, Redmond, Oreg.; bids Jan. 24.

242 tons, 4 and 6-inch, class 150, Oakland, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

113 tons, 4 to 8-inch, class 150, San Rafael, Calif.; bids Jan. 21.

100 tons, 4 and 6-inch, Public Service Corp. of New Jersey, Newark.

Unstated tonnage, 4000 feet of 6-inch, water supply, Stratford, Wis.; bids soon.

Unstated tonnage, new waterworks, Ootsburg, Wis., cost $30,000; bids about April 1.

Unstated tonnage, 8000 feet of watermains, Waldo, Wis.; bids early in spring.

Steel Pipe Pending

Unstated tonnage, gas pipe line to be built from central Michigan to Lansing, Flint and Detroit, by Michigan Gas & Electric Co.; hearing on petition to lay the line to be held Jan. 24.

Strip Steel

Strip Prices, Page 45

Pittsburgh—Owing to heavy backlogs of cold-rolled strip steel some producers are now unable to promise delivery until at least the third week in February. Hot-rolled strip deliveries are slightly better, but backlogs are also mounting. Strip operations are at a strong 60 per cent of capacity. Buyers are paying 1.85c, Pittsburgh, for hot strip and 2.60c, Pittsburgh or Cleveland, for cold strip.

Chicago—Orders for both hot and cold-rolled strip steel have increased substantially, cold-rolled leading, party due to heavy requirements of the automotive industry. Orders from other consumers have increased materially, however, and prompt delivery invariably is requested.

Cleveland — Except automobile tonnage there is little in the market. Wide strip mills in this district are working at capacity on automobile specifications, and the earliest deliveries that can be promised are in the first week in September. Mills rolling only the narrower widths of strip noted a reduction in specifications during the week.

Philadelphia—Demand for narrow hot strip continues quiet. Due to heavy demand in the Middle West from autobody manufacturers, some district sellers here are unable to furnish deliveries on hot-rolled strip wider than 24 inches. Cold-rolled strip is moving in better volume to manufacturers of garden tools. Prices are steady at 2.89c, Philadelphia, for cold strip, and 2.14c, for hot strip.

Boston—While some improvement is noted in cold-rolled strip buying it is less than in other light lines. Some rerollers have somewhat heavier backlogs but not for long runs.

New York—Strip sellers note little improvement in demand for narrow widths and on wider encounter difficulty quoting satisfactory deliveries, due to the sold-up condition of many mills on autobody and fender tonnage. Prices are unchanged at 2.18c, New York, for hot-rolled and 2.93c for cold-rolled.

Shapes

Structural Shape Prices, Page 44

Chicago—Placing of 5100 tons of piling and fabricated plates and shapes for the Guttenberg, Iowa, dam completes orders for this type of work on the Mississippi river under the government program, for the present, but there are plans to build additional locks and dams. Federal engineers have recommended the appropriation of an additional $35,000,000 for this work. Awards elsewhere are light. Inquiries total about 5000 tons, the largest being 2300 tons for the Ashland avenue bridge, Chicago.

Philadelphia—Structural buying is limited to a few small bridges totaling approximately 225 tons. A pier development for the Du Pont interests at Edge Moor, Del., requiring a similar tonnage is scheduled for placing shortly. Reports that these interests have just placed a round tonnage of structurals for other work at Edge Moor are unconfirmed. Bids will be opened Feb. 5 for a postoffice here requiring approximately 400 tons of shapes and 100 tons of bars.

Pittsburgh—Low bidders on the Pennsylvania state highway letting of Jan. 11 are C. F. Goeringer Construction Co., Wilkes Barre, Pa., for Sullivan county work taking 265 tons of structural shapes, and Graham Construction Co., for Tioga county work involving 85 tons, as well as on a 930-foot plate girder span in Tioga county taking 45 tons of fabricated structurals. Among new inquiries are 300 tons for a Pittsburgh hospital.

Cleveland—Considerable commercial buiding work in the 25 to 50-ton class is being figured by fabricators here, but not much heavy tonnage is in prospect. Grade elimination work will be held up by the railroads pending determination of how far the government is going with its program, and how much it will contribute. State bridge and road work is slow.

San Francisco—Structural awards in the week were not numerous, totaling less than 1000 tons. Outstanding lettings included 550 tons for two Kress stores in Honolulu, booked by a Pacific coast fabricator. Bids will be opened about March 1 on 1275 tons for a viaduct in connection with the San Francisco-Oakland bay bridge, San Francisco. The postoffice at Phoenix, Ariz., up for bids on Feb. 15, will require 500 tons. Fabricators are looking forward with considerable interest to the coming eleventh annual steel conference at Del Monte, Calif., Feb. 7-9.

Seattle—McRae Bros., Seattle, submitted the low bid of $55,349 for the navigation lock bridge, Boaneville, Oreg., dam, requiring 133 tons of shapes and machinery. Bids are expected to be called within 60 days for the state Ebey slough bridge, near Everett, Wash., estimated at $300,000. Seattle is asking bids for galvanizing 235 tons of steel angles for the Diablo power project transmission line, recently awarded to Pacific Coast Steel Corp., Seattle.

New York—Award of 3250 tons by the Frederick Snare Corp., New York, for the Tygart river reservoir dam, Grafton, W. Va., to American Bridge Co., and Carnegie Steel Co., Pittsburgh, features the structural market.

Fabricated structural steel showed a marked decline during December, according to the American Institute of Steel Construction, New York. Bookings during that month were approximately 40 per cent less than the average for the first half of the year, and 44 per cent less than for the same month of 1933.

Shape Contracts Placed

5100 tons, dam, Guttenberg, Iowa; 2800 tons, piling, to Inland Steel Co., Chicago, 2300 tons, fabricated steel, to R. C. Mahon Co., Detroit.

3250 tons, Tygart river reservoir dam, Grafton, W. Va., including 1700 tons, structurals, to American Bridge Co., Pittsburgh, and 1550 tons, piling, to Carnegie Steel Co., Pittsburgh; Frederick Snare Corp., New York, general contractor.

950 tons, state highway bridge, Revere, Mass., to Lackawanna Steel Construction Corp., Buffalo.

860 tons, bridge, Reno county, Kansas, to Kansas City Structural Steel Co., Kansas City, Mo.

620 tons, six small Georgia state highway bridges, to Austin Bros. Bridge Co., Atlanta, Ga.

550 tons, two Kress stores, Honolulu, T. H., to Pacific Coast Steel Corp., San Francisco.

290 tons, piling, dock, Medusa Portland Cement Co., Manitowoc, Wis., to Inland Steel Co., Chicago.

290 tons, state bridge, Gassaway, W. Va., to Midland Structural Steel Co., Cicero, Ill.

260 tons, New York state highway bridge, Unadilla, N. Y., to Harris Structural Steel Co., New York.

250 tons, Great Bend bridge and approaches, Jefferson county, New York, to McClintic-Marshall Corp., Bethlehem, Pa.; through Leonard J. Gates, Cape Vincent, N. Y.

227 tons, three bridges, one at Westmont, Pa., for the Reading Co., another in Tioga county for the state of Pennsylvania, and another in Wyoming county for Pennsylvania, to the Belmont Iron Works, Philadelphia; American Bridge Co., Pittsburgh; and the Anthracite Bridge Co., Scranton, Pa., respectively.

195 tons, Clopay Corp., building, Cincinnati, to R. C. Mahon Co., Detroit.

190 tons, bridge, Winnebago county, Illinois, to Midland Structural Steel Co., Chicago.

170 tons, Pennsylvania state highway bridge, Bobsville, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, state highway bridge, Pike county, Kentucky, to R. C. Mahon Co., Detroit.

150 tons, bridge, project NRS 783F, Stonewall county, Texas, to Austin Bros., Dallas, Tex.

135 tons, state bridge, Holyoke, Mass., to American Bridge Co., Pittsburgh; Daniel O'Connell's Sons, Holyoke, general contractors.

130 tons, bridge, NRM 256-E, Kingfisher county, Oklahoma, to Capital Steel & Iron Co., Oklahoma City, Okla.

125 tons, bridge, section 21 VC NRH, Stephenson county, Elroy, Ill., to A. C. Woods Construction Co.

120 tons, addition, shipping building, Republic Steel Corp., Youngstown, O., to Truscon Steel Co., Youngstown.

110 tons, school, South Glens Falls, N. Y., to Smith & Caffrey Co., Syracuse, N. Y.; through T. C. Brown Inc.

100 tons, three-story building, Third avenue and Forty-second street, New York, to George A. Just Co., Brooklyn, N. Y.

Shape Awards Compared

	Tons
Week ended Jan. 19	14,222
Week ended Jan. 12	9,246
Week ended Jan. 5	24,023
This week in 1934	10,720
Weekly average, 1934	16,284
Weekly average, 1935	15,830
Weekly average, December	9,078
Total to date, 1934	53,933
Total to date, 1935	47,491

Shape Contracts Pending

2300 tons, superstructure, Ashland avenue bridge, Chicago.

1275 tons, crossing over Southern Pacific tracks and Key route subway, San Francisco-Oakland bay bridge, San Francisco; bids about March 1.

930 tons, state highway bridges, Missouri; bids Jan. 26.

800 tons, bridge, Joliet, Ill., for Santa Fe railroad.

600 tons, structures for Maricopa county water district, Arizona; bids opened.

500 tons, postoffice, Phoenix, Ariz.; bids Feb. 15.

500 tons, bridge, Marinet, Ariz.

450 tons, state highway projects, Virginia, mainly Wise and Culpepper counties; bids Jan. 29.

450 tons, state bridge, Gary, Ind., Northern Bridge Co., Gary, low for general contract.

400 tons, school, Calumet City, Ill.

400 tons, addition to city hospital, Worcester, Mass.; bids in.

350 tons, bridge, Topeka, Kans.

300 tons, municipal hospital annex, Mayview, Pittsburgh.

265 tons, state bridge, route 291, Sullivan county, Pennsylvania; C. F. Goeringer Construction Co., Wilkes Barre, Pa., low on general contract at $47,224.40. This project also requires 26 tons of plain steel bars.

250 tons, bridge, Texas county, Oklahoma.

250 tons, bulkhead gates, Boulder dam, Boulder City, Nev.; bids Jan. 28.

200 tons, bridge, Durand, Mich.

200 tons, two 20-ton locomotive cranes, specifications 7857, Mare Island, Calif., navy yard; bids soon.

175 tons, bridge No. 832, Richmond, Va., for Chesapeake & Ohio, Cleveland.

170 tons, city bridge, Carpentersville, Ill.; bids opened Jan. 18.

150 tons, shapes and bars, state bridges and highways, Connecticut; bids Jan. 8.

147 tons, state crossing in Washington and Yuma counties, Colorado; bids Jan. 22.

135 tons, state service building, Exeter, R. I.

133 tons, including machinery, navigation lock bridge, Bonneville, Oreg., dam project; McRae Bros., Seattle, low.

120 tons, bridge, Ouachita parish, Louisiana; bids Jan. 30.

100 tons, comprised of 85 tons of structural shapes and 15 tons of plain steel bars, state highway bridge, route 22, Tioga county, Pennsylvania; Graham Construction Co., Lancaster, Pa., low at $27,591.46.

Unstated tonnage, completion of Wabash railroad bridge across Missouri river at St. Charles, Mo.; $2,350,000 PWA loan approved.

Unstated, Columbia slough bridge, Multnomah county, Oregon; bids at Portland soon.

Unstated, Ebey slough state bridge, Snohomish county, Washington; bids within 60 days.

Reinforcing

Reinforcing Bar Prices, Page 45

Pittsburgh—Award of approximately 800 tons of new billet steel reinforcing bars by Dravo Contracting Co., Neville Island, Pittsburgh, for the Gallipolis, O., dam is expected shortly. Numerous Pennsylvania state highway projects continue to be advertised each week, though individual jobs are small. Award recently to Carnegie Steel Co., Pittsburgh, of 1750 tons of rail steel bars for the Tygart river reservoir dam, Grafton, W. Va., marks the entrance of Carnegie company into the rail steel bar business in a sizable way.

Chicago—Larger awards of reinforcing bars involve about 1200 tons, the leading item being 800 tons for the Guttenberg, Iowa, dam. Road contractors defer purchasing of bars for state work for which general contracts have been placed and a fair volume of such business is in prospect for later in the quarter.

Philadelphia—While reinforcing bar tonnage is moving slowly, sellers look for a sharp increase in February for public projects. Billet steel bars, cut lengths, are 2.05c, Pittsburgh, or 2.34c, Philadelphia.

San Francisco—Awards of reinforcing bars so far this year are more than double those for the

Concrete Awards Compared

	Tons
Week ended Jan. 19	2,489
Week ended Jan. 12	6,560
Week ended Jan. 5	938
This week in 1934	3,899
Weekly average, 1934	4,084
Weekly average, 1935	3,329
Weekly average, December	2,408
Total to date, 1934	16,515
Total to date, 1935	9,987

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DETROIT

same period a year ago, and prospects for the first quarter are encouraging. Included among the larger lots placed were 350 tons for high school buildings in Venice, Calif. Bids have been opened on 3500 tons for the Moffatt tunnel project in Colorado. New inquiries include 1500 tons for a viaduct over the Southern Pacific tracks and the Key route subway, in Oakland, Calif., in connection with the approaches for the San Francisco-Oakland bay bridge.

Seattle — Reclamation bureau officials state 12,500 tons will be required in the near future for the Coulee, Wash., dam, also 117 tons for bridge approaches. Other business pending is small, and the week's awards included none in excess of 100 tons.

Cleveland—The market is quiet, with award of 1100 tons for the Muskingum, Ohio, conservancy district, on which bids are in, pending.

New York—Awards are light, but several thousand tons are pending. New Jersey has closed general contract bids on 230 tons for highways, while lettings include 100 tons for a Manhattan, New York, pier.

Reinforcing Steel Awards

800 tons, dam, Guttenberg, Iowa, to Inland Steel Co., Chicago.
350 tons, buildings for high school, Venice, Calif., to unnamed interest.
300 tons, sewage disposal plant, Fargo, N. Dak., to Inland Steel Co., Chicago.
200 tons, Lawton school, San Francisco, to Gunn, Carle & Co., San Francisco.
150 tons, city hall, Sioux Falls, S. Dak., to Hassenstein Steel Co., Sioux Falls
150 tons, buildings for state hospital, Camarillo, Calif., to unnamed interest.
127 tons, Ninety-fifth street bridge, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.
112 tons, two Kress stores, Honolulu, T. H., to Pacific Coast Steel Corp., San Francisco.
100 tons, building, Mills Novelty Co., Chicago, to Truscon Steel Co., Youngstown, O.
100 tons, alterations to William McKinley junior high school, Los Angeles, to unnamed interest.
100 tons, Outlook building, Santa Monica, Calif., to unnamed interest.

Reinforcing Steel Pending

12,500 tons, Coulee, Wash., dam project; bids soon by bureau of reclamation, Denver.
2125 tons, contract No. 15, San Francisco-Oakland bay bridge, San Francisco; Healy Tibbetts Construction Co., San Francisco, awarded general contract.
1500 tons, crossing over Southern Pacific tracks and Key route subway, San Francisco-Oakland bay bridge, San Francisco; bids about March 1.
1125 tons, contract No. 15-A, San Francisco-Oakland bay bridge, San Francisco; Healy Tibbetts Construction Co., San Francisco, awarded general contract.
1000 tons, track depression and elevated highway projects, New York Central, Manhattan, New York.
500 to 750 tons, wharf at foot of Fourteenth street, Oakland, Calif.; bids soon.
230 tons, two highway sections, Passaic and Somerset counties, New Jersey; Lafera-Grecco Contracting Co., low.
250 tons, subway at Folger avenue, Berkeley, Calif., under Southern Pacific tracks, San Francisco-Oakland bay bridge; bids about Feb. 21.
209 tons, highway project 677-U-2, Tangipahoa parish, Louisiana; bids Jan. 30.
190 tons, repairs to Hodges dam, San Diego, Calif.; bids soon.
175 tons, state hospital building addition, Taunton, Mass.
150 tons, sewage disposal plant, Radnor township, Pennsylvania; bids Jan. 23.
144 tons, highway project 4608, Ouachita parish, Louisiana; bids Jan. 30.
146 tons, Michigan state highway work, Iron Mountain, Mich.
127 tons, state crossings in Pinal and Yuma counties, Arizona; bids opened.
117 tons, bridge approaches, Coulee, Wash., dam project; bids soon by bureau of reclamation, Denver.
105 tons, state highways and bridges, Virginia; bids Jan. 29.
100 tons, city hospital addition, Worcester, Mass.
100 tons, government barracks, Carlisle, Pa.; bids Feb. 7.
100 tons, estimated, postoffice, Philadelphia; bids Feb. 5.

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Tin Plate

Tin Plate Prices, Page 44

Pittsburgh—Tin plate operations have advanced 15 points to 65 per cent. Some of the smaller independents are at capacity, whereas a leading interest continues at about 60 per cent. The rate of incoming canmakers' orders exceeds production. While tin plate consumption in 1934 ran considerably ahead of production, the coming season is calculated to bring production and consumption in more even balance. The Pittsburgh base of $5.25 per base box on contracts, continues firm.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 45

Fewer buyers of bolts and nuts were in the market last week at Pittsburgh, owing to the comparatively heavy stocks they accumulated before the price advance Jan. 1. On new business bolts and nuts now are quoted 70, 10 and 10 off list. Large rivets are unchanged at 2.90c, Cleveland or Pittsburgh, 3.00c,

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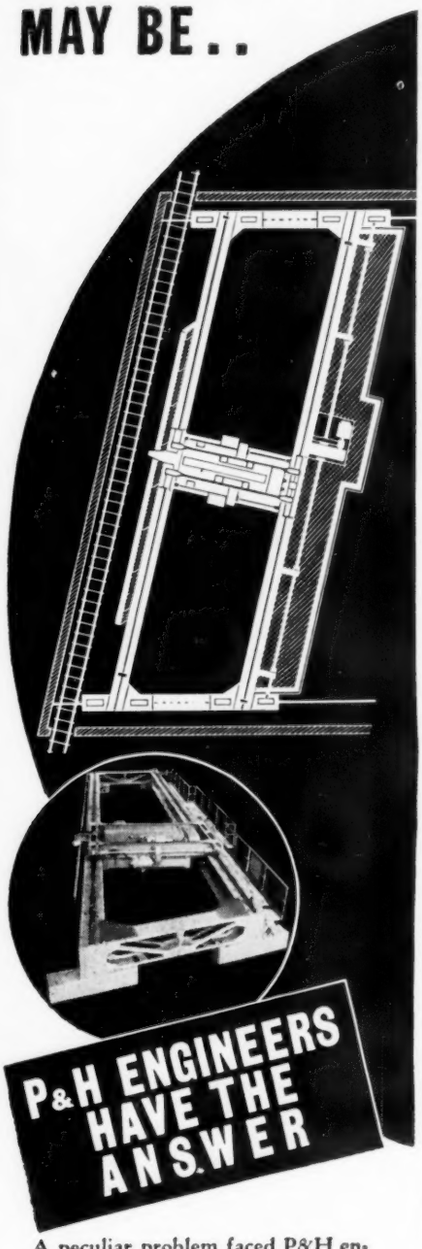

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THE MARKET WEEK

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At Cleveland nut and bolt manufacturers report 60 per cent of their current output going to automobile manufacturers. Production for the industry generally is holding at a strong 45 per cent rate. Railroads are buying sparingly. Chicago sellers find business increasing but railroad requirements are light. Agricultural implement manufacturers are buying more heavily.

Semifinished

Semifinished Prices, Page 45

A change to be considered soon by producers of rerolling billets will center about a reclassification of base sizes. It is felt by many buyers they were unduly discriminated against with the extras put in effect Jan. 1. Other semifinished steels are moving at a brisker rate, especially sheet bars and wire rods. Sales of skelp and tube rounds are fair. The Pittsburgh prices on these products are unchanged.

Cold Finished

Cold Finished Prices, Page 45

Pittsburgh — The automobile industry accounts for most of the cold-drawn bar market's gains over December. Some cold-drawn producers have booked more new business in January than in the entire month of December. Buyers are reported paying the full 2.10c, Pittsburgh base, on carbon cold-drawn bars and 2.95c, Pittsburgh base, on alloy cold-drawn.

Quicksilver

New York—Quicksilver prices are unchanged in a quiet market. Round lots of 100 virgin flasks of 76 pounds are quoted down to $72.50 a flask, with small lots of 15 to 24 flasks, inclusive, steady at $74.

Coke By-Products

Coke By-Product Prices, Page 45

New York—Coke oven by-products shipments are heavier. Toluol and xylol demand is active, lacquermakers reflecting greater automobile production. Naphthalene specifications against contracts have improved slightly. Prices on naphthalene are lower at 5.25c a pound in barrel lots. Some has been under that quotation. Industrial consumption of phenol has gained.

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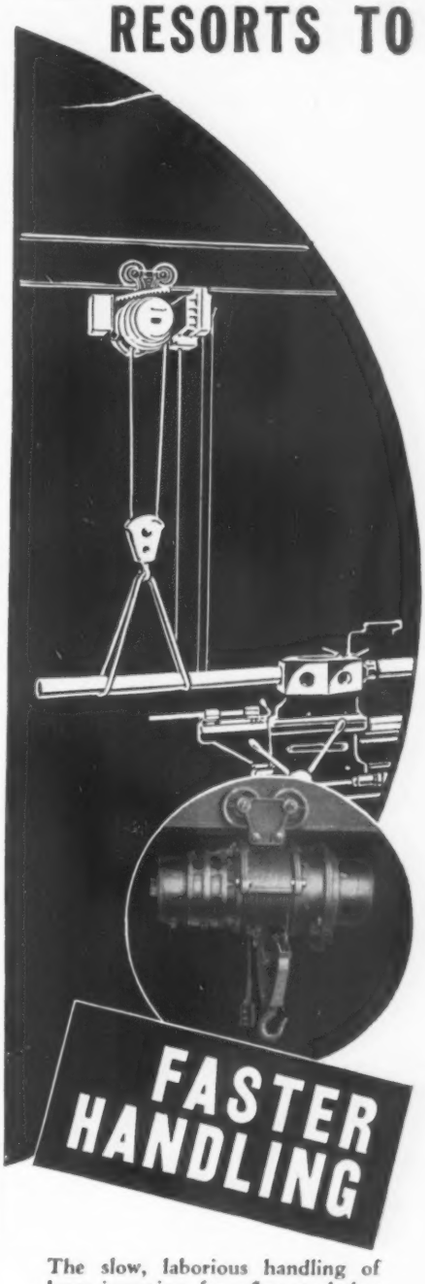

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Pig Iron

Pig Iron Prices, Page 46

Chicago—Pig iron shipments hold recent gains in comparison with the rate a year ago and the volume of new business points to a continuation of the upturn in deliveries during the remainder of the quarter. This is the sixth consecutive month in which shipments have expanded. Farm implement manufacturers continue an important factor in the total foundry melt, with automotive needs also outstanding. Malleable foundries are taking relatively larger tonnages of iron than was true a short time ago, due to inability to obtain sufficient supplies of scrap.

Cleveland—The market continues strong, 20,000 tons being booked here recently. Some melters say they are unable to obtain delivery of scrap contracted for at lower prices than those which prevail today, and are buying more pig iron. Fully 85 per cent of the iron is being purchased without preliminary inquiries. Orders range up to 1000 tons. Some heavier buying by automobile manufacturers is prospect, as stocks have been reduced.

Pittsburgh—Idle since June, 1934, the No. 1 merchant furnace of Shenango Furnace Co., Sharpesville, Pa., has resumed. National Tube Co., also has lighted a furnace, at McKeesport, Pa., and at least six more stacks will be blown in within a week or ten days. Pig iron buying at present still is confined to small lots. On a Neville Island base, pig iron remains quoted $18 for basic, $18.50 for foundry and $19 for bessemer grades.

New York—Pig iron specifications are increasing slowly, with the remainder of this month expected to be more active. Orders are still confined chiefly to lots of 100 tons and less and in practically all cases are for prompt shipment.

Philadelphia—Pig iron releases so far this month have proved somewhat disappointing to sellers. Requirements are still spotty and confined almost entirely to small tonnages. With stocks at most consuming plants light, sellers still look for substantial improvement as seasonal influences become more pronounced. Pipe makers are the exception to the rule with regard to stocks, their supplies still being heavy. Prices are steady, with strength imparted by advancing scrap prices.

Cincinnati—Pig iron shipments continue upward and the melt in the district is heavier, especially in the automobile foundries.

Buffalo—Increased buying of pig iron is noted in the district with shipments also broadening. Melt is improving steadily and the outlook is much brighter than at any time in recent months.

Birmingham, Ala.—Addition to the surplus stock of pig iron at blast furnaces is limited indicating a fairly steady movement of iron. Five furnaces are in blast, three on foundry iron and two on basic.

St. Louis—Uncertainty relative to the gold clause issue has had a depressing effect on all business here, including pig iron. Melters are hesitant about making commitments, though in numerous instances they are in actual need of supplies. Melters of gray iron and malleable have had a steady increase in activity since the holidays.

Scrap

Scrap Prices, Page 47

Pittsburgh—Last week National Tube Co. purchased an estimated 40,000 tons of heavy melting steel, rails and compressed sheet scrap for shipment to Lorain, O., works. It is reported that approximately $12 per ton was paid. Purchases by a leading interest at $14 for dealer heavy melting steel and $15 for heavy railroad grade steel caused a 50-cent advance in each of these markets last week. Machine shop turnings advanced 50 cents a ton and an upward movement in specialties was sympathetic. Sensing a temporary dullness after this advance, brokers late last week dropped their buying prices in some cases to $12.75 on No. 1 steel. However, the market undertone is noticeably strong.

Cleveland—Little scrap is being sold for local melting but shipments to outside points continue. Supplies are becoming scarce and prices are firm, though unchanged.

Chicago—The scrap market has reacted after a sustained and substantial rise and prices of leading grades are lower. Holders of scrap now are more willing to sell. Sales of No. 1 heavy melting steel are reported at $12 to $12.50, although dealers are able to pick up material at only slightly below the former figure. Automotive heavy melting steel is bringing $11.50, at which figure several moderate lots have been purchased. On the other hand, some grades continue scarce and prices remain strong. Foundries find little malleable scrap available and in some instances have been forced to use a larger volume of pig iron.

Detroit—Scrap prices are unchanged and considerable uncertainty attends the outlook. Scrap consumption is moderately heavier at local steelworks.

Buffalo—Buffalo district consumers are making liberal purchases of

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scrap. It is estimated that more than 10,000 tons of heavy melting steel has been purchased this month and that much more remains to be covered soon. Prices have been steady in the latest deals at $12 for No. 1 heavy melting steel and $10.50 for No. 2. Other grades have risen proportionately.

Birmingham, Ala.—Improvement in demand for steel and iron scrap has been below expectations and supplies are large.

Cincinnati—The iron and steel scrap market is strong but slightly less active. A note of hesitancy was called a reflection from the gold clause cases pending in the United States Supreme Court.

Boston—Unabated strength prevails on active grades of scrap. For export No. 1 heavy melting steel has advanced to $9.25, dock, although $9 is still paid on some transactions. Most buying is for export, but a better movement to domestic consumers is also a factor.

Philadelphia—Although devoid of large tonnages, the scrap market continues strong with advances in several grades for domestic consumption and an increase of 50 cents per ton in the dock price of No. 1 and No. 2 steel here. These latter two grades are now $10.50 and $9.50, wharf, respectively, and continue to represent what dealers are willing to pay for material in covering back contracts. Melting steel for domestic use is higher, No. 1 being quoted at $11.50 to $12. One mill rarely in the market for this grade is said to have placed a moderate tonnage at $12, and another consumer has bought 400 tons of specially selected scrap for Steelton, Pa. Two principal consumers of this grade are out of the market. No. 2 heavy melting steel is higher at $10 to $10.50 on small scattered buying.

St. Louis—The market for iron and steel scrap has developed an easier tone, though no specific reductions in prices have been made. Softness is based on outside influences, mainly political and economic, there being no change in actual supply and demand.

New York—Heavy melting steel grades for export have been advanced 25 cents per ton to $9, barge for No. 1 and $7.50 for No. 2. Export demand continues brisk but scrap is coming out less freely. Domestic demand is light. Compressed sheets are 50 cents higher. Except for melting steel the market is listless, but prices are firm.

Seattle—While shipments are active on contracts, the market continues quiet due to holidays in Japan. Only a few inquiries have been received this week, buyers' offers being out of line. On this side exporters are inclined to stand firm for higher prices. Local consumption is below normal.

Warehouse

Warehouse Prices, Page 48

Cleveland—Both orders and tonnage have made further improvement. Buying appears more widespread, and includes more products.

Detroit—Jobbers' business is well maintained above the rate of late 1934. Prices are unchanged.

Chicago—Warehouse sales are fairly active and well diversified, moderately ahead of the rate a year ago. Bolt and nut prices have been advanced to 70 off list on lots of 100 pounds and over, and to 65 off on lots of less than 100 pounds. These discounts replace the former quantity extras.

Pittsburgh—Number of warehouse steel orders has increased considerably the past week. January should be considerably improved over December. Prices for all warehouse products generally are steady but quotably unchanged.

New York—Warehouse volume failed to improve during the first half of the month, but held to the December rate. Slight improvement in the number of small orders has developed during the last few days. Prices are unchanged.

St. Louis—Warehouses report business fairly satisfactory. Gain in demand following the holiday and inventory period was more rapid than ordinary.

Seattle—Volume of warehouse sales is fairly active, stimulated by public expenditures and some replacements in industrial plants. Seattle has purchased a 60-ton capacity steel moving car and awarded a contract for miscellaneous galvanized bolts and nuts to the Pacific Coast Forge Co., Seattle.

Philadelphia—Unchanged prices and steady volume of business feature the local warehouse market. Jobbers discount present dullness as seasonal.

Cincinnati—Improved sales by warehouses may put January tonnage of some jobbers 20 to 25 per cent above December orders. Prices are unchanged.

Metallurgical Coke

Coke Prices, Page 45

Domestic heating coke offered by by-product and beehive producers from the western Pennsylvania district continues to find a highly unsettled market in the East, centering in Brooklyn, N. Y., and New York, where wholesalers have been offered

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imported coke considerably below the domestic market.

Pittsburgh district coke producers continue to move considerable tonnages to the Buffalo and southern Canadian markets. Not under code regulation, the market on by-product coke continues to figure back to around $3.45 per ton at the ovens in the Pittsburgh district. Under code regulation, prices on beehive coke are steady and unchanged.

Shipments of by-product foundry coke at Chicago are increasing, indicating heavier melt of iron. Prices there are steady. Birmingham, Ala., producers continue at a steady rate, with shipments to outside districts unchanged.

Refractories

Refractories Prices, Page 46

Pittsburgh — Though refractory specifications are increasing, few open hearth or blast furnace operators are building up inventories. Prices are steady on the basis of $45 per 1000, Pennsylvania works, for fire clay brick, first quality; $40 for second quality and $45 for silica. Imported dead-burned magnesite grains are $45 per ton, with domestic $40, Chester, Pa., and Baltimore, and domestic dead-burned grains $22, Chewelah, Wash. Magnesite brick is quoted at $65 per ton for basic open-hearth use with chrome brick $45 per ton and chemically bonded magnesite $55. A new chemically-bonded chrome brick is expected to be announced by a leading refractory maker shortly.

Ferroalloys

Ferroalloy Prices, Page 46

A price of $26, New Orleans has been filed with the steel code authority on 19 to 21 per cent spiegeleisen, effective Jan. 20. This is an initial filing at this point and is comparable with the furnace price quoted by a large domestic producer on lots up to 50 tons. Spiegeleisen specifications show further increase, as steel making operations expand. This is also true of ferromanganese, with releases possibly the heaviest in more than a half year. The market on ferromanganese is $85, duty paid, Atlantic and gulf ports.

A price of $24, Palmerton, Pa., effective Jan. 27, has been filed with the institute on spiegeleisen. This is believed to apply to lots of 50 tons and over, 19 to 21 per cent, although definite confirmation is lacking.

Iron Ore

Iron Ore Prices, Page 46

Cleveland—The steel industry starts the year with 34,373,002 tons of iron ore on hand with monthly consumption between 1,500,000 and 2,000,000 tons. Indications point to an excess of available supplies at lower lake ports and furnaces when the shipping season starts. The Lake Superior Iron Ore association reports:

	Tons
Consumed in November	1,298,404
Consumed in December	1,505,751
Increase in December	207,347
Consumed in December, 1933	1,597,680
On hand at furnaces Jan. 1, 1935	29,217,671
On Lake Erie docks, Jan. 1, 1935	5,155,331
Total at furnaces and Lake Erie docks Jan. 1, 1935	34,373,002
Total Jan. 1, 1934	34,673,149

The Lake Carriers association, Cleveland, reports bulk freight tonnage on the Great Lakes in 1934 totaled 75,739,490 tons, 6 per cent over 1933. Shipments included 35,476,575 tons of coal and 7,392,218 tons of limestone.

Nonferrous Metals

Nonferrous Metal Prices, Page 46, 47

New York — Nonferrous metal prices held steady last week with the exception of tin which was affected by unsettled monetary exchange early in the period. Volume of copper sales continued to increase with the total so far in January passing the 15,000-ton mark.

Copper—Market was steady here on basis of 9.00c, Connecticut, for electrolytic. Foreign copper was weak and declined to as low as 6.80c early in the week. Hope is expressed that the normal book of 30,750 tons will be equalled by the end of January in the domestic market. Buying has been for actual needs and reflects a better demand for products.

Zinc—Sales for the week will likely approximate 4000 tons although surface appearances indicated a quiet market. Spot held at 3.75c, East St. Louis, and second quarter metal at 3.80c.

Lead—Sales declined from the fairly active rate of the previous week. Prices held unchanged with a strong undertone. Trade sentiment is optimistic.

Tin — Straits prices fluctuated widely due to rapid change in the Sterling exchange rate. Scarcity of spot metal developed which permitted a marked premium on that position compared with nearby and future months. Outlook for tin consumption is steadily improving. Tin plate mill operations have increased to around 50 per cent of capacity.

Antimony—Demand was spotty and confined to small lots. Prices were unchanged on basis of 14.50c, duty paid, for Chinese spot.

Aluminum—Demand has picked up materially since the end of last month but prices continued firm.

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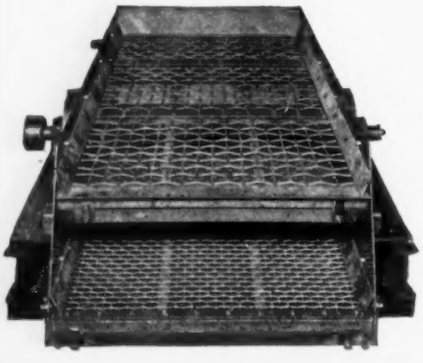

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Steel in Europe

Foreign Steel Prices, Page 48

London—(*By Cable*)—Production of pig iron in Great Britain totaled 513,500 tons in December, compared with 507,600 tons in November. The daily average rate in December was 17,116 tons, in November 16,920 tons. In both months 96 stacks were active.

Production of steel ingots and castings dropped from 766,000 tons in November to 654,000 tons in December, the daily rate falling from 29,461 tons to 25,153 tons.

Imports of iron and steel into Great Britain rose from 104,086 tons in November to 114,498 tons in December; exports declined from 219,879 tons in November to 186,824 tons in December.

Greater activity in the British iron and steel markets is evident, and some contracts extend into June. Pig iron exports are increasing slowly, some hematite going to Italy. No immediate change is expected in domestic prices.

Exports from the Continent are expanding, Great Britain buying considerable semifinished steel. The Argentine, Scandinavian, Greek and Egyptian markets are more active. French steelmakers have booked a substantial steel order for Russia. Germany is extending its barter

Production

STEELMAKING displayed a strong tendency last week, rising 5½ points to 51 per cent, highest rate since last June, and comparing with a rate of 35 per cent in the comparable period of 1934. Expectations are for a further increase this week. Details of various districts follow:

Wheeling—Up 6 points to 90 per cent last week, with some producers now considering their operations at practical capacity. Thirty-two out of 37 open-hearth furnaces are now on active schedule. Wheeling Steel Corp. blew in its Benwood, W. Va., blast furnace last week.

The rate next week will be 95 per cent, with 33 open hearths scheduled. Wheeling Steel Corp. starting this week will be at capacity with ten open hearths on at Steubenville and nine at Portsmouth, O., greatest number active since June, 1930, with the exception of July and August, 1933.

Chicago—Rose 7 points to 56 per cent last week, with increased blast furnace schedules resulting from the lighting of two additional stacks. Thirteen of 36 steelworks blast furnaces now are active. One merchant furnace also is blowing.

Pittsburgh—Up 6 points to 33 per cent last week, with a further gain of 2 points scheduled this week. Both Carnegie Steel Co. and Jones & Laughlin Steel Corp. are now strongly supporting the rate.

Seventeen steelworks blast furnaces are now active, a gain of one, as National Tube Co. blew in a second Monongahela works furnace Jan. 16. This week, at least four more blast furnaces will be lighted, a Carnegie at Clairton, an Edgar Thomson, a Bethlehem at Johnstown, and a Jones & Laughlin at Aliquippa. Carnegie also has plans to relight two valley furnaces.

McKeesport Tin Plate Co., McKeesport, Pa., Monday was to start at capacity operations, operating 44 hot mills three shifts, and employing 3000.

Youngstown—Climbed 4 points to 60 per cent last week and the rate is expected to rise to 63 per cent at the beginning of this week.

New England—Unchanged at 68 per cent last week and this rate will probably hold this week.

Birmingham — Off 4½ points to 29 per cent last week. Open-hearth furnaces are being given attention with an idea of being called into commission at any time, indications pointing to need for greater output of ingots. Four open-hearth furnaces are in operation at the Fairfield works of Tennessee Coal, Iron & Railroad Co., and three at Gadsden for Gulf States Steel Co.

Buffalo—Climbed to 42 per cent last week, a gain of 3 points. Sixteen open hearths are producing steel and this number will continue in operation throughout the month.

Central eastern seaboard — Up approximately 1½ points, to 27 to 28 per cent. An eastern Pennsylvania rail mill resumed operation last week, after more than a month's suspension and an increase in steelmaking was noted at two other points. Further slight expansion in miscellaneous demand, combined with good releases for tin plate, point to further improvement this week.

Detroit—Gained 12 points last week to 71 per cent, owing to the addition of 2 open hearths by a leading interest. Twelve furnaces are now active, one producer scheduling eight and another four.

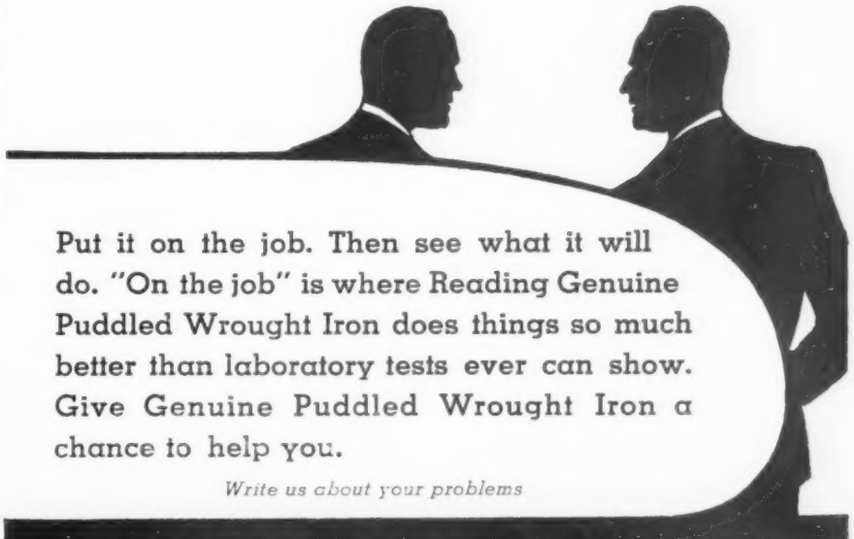
Cleveland-Lorain—Unchanged at 82 per cent, Corrigan, McKinney Steel Co. operating 13 open hearths; Otis Steel Co., 8, and National Tube Co., Lorain, 11.

SHEET SALES JUMP

Average daily sheet steel sales increased to 6230 net tons in December, from 4444 tons in November; output to 5153 tons from 4768; shipments to 4566 tons from 3629 tons, according to the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. Totals for December: Sales 193,130 tons; production 159,740 tons; shipments 141,566 tons. Total sheet capacity in the United States for the month was 550,000 tons, and the capacity on which the association's figures are based was 325,000 tons.

Equipment

Pittsburgh—Rotary Electric Steel Co., Detroit, noted in STEEL last week as having purchased a new roughing mill, advises that contract was placed with E. W. Bliss Co., Salem, O., for



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a 28-inch roughing mill to be used at its Detroit works in connection with the company's hot finishing mills on both bars and strip steel. The new rougher is designed to supplant an 18-inch roughing mill which recently was found to be too small to supply billets for the company's recently built cold-rolled strip steel department. Carnegie Steel Co., which has begun work on foundations to its new 42-inch continuous strip mill at Youngstown, O., has been awarding subcontracts for the mill and recently placed orders for the roller bearings required.

Chicago — Inquiries for various types of machinery and equipment continue to improve but sales are increasing at a somewhat slower rate. The latter trend is ascribed partly to uncertainties prevalent in the business and political situation. Manufacturers of canning machinery experienced relatively brisk business at the convention of canners and allied tradesmen here the past week. Sales were substantially heavier than a year ago and in the best volume in most instances in several years. Orders for machine tools show little change except in small tools which are in better demand as a result of continued improvement in operations of various metalworking industries.

Construction and Enterprise

Ohio

CLEVELAND—High Voltage Equipment Co., manufacturer of products for electrical companies, has moved into a 2-story building on East Seventy-ninth and Rapid Transit tracks.

CLEVELAND—Bonnar-Vawter Fanform Co., manufacturer of office equipment, has leased the former plant of the Morgan Lithograph Co. at East Thirtieth street, between Superior and Payne avenues, for manufacturing purposes.

COLUMBUS, O.—City is planning construction of electric light and power plant. Fund of $320,000 has been approved by PWA for the project.

COSHOCTON, O.—Universal Houses Inc., Zanesville, O., is planning to establish a plant here for the manufacture of steel houses. The plant will employ approximately 50 persons.

CUYAHOGA FALLS, O.—Atlas Mold & Machine Co. has been incorporated with $10,000 capital, by R. W. Wagoner, Harry E. Anderson, A. J. Williamson, and Robert M. Wholwend, 207 Delaware building, Akron, O.

MIDDLETOWN, O.—Preparing for expected increased business in 1935, Z. W. Ranck, president of the Crystal Tissue Co., has announced a $50,000 plan for improvements.

Michigan

DETROIT—J. K. Hofer Brewing Co., 3156 Penobscot building, has been formed to engage in brewing business, by Fred W. Martin, 4380 Apple street.

DETROIT—Cadillac Engineering & Mfg. Co., 1606 United Artists building, has been incorporated to deal in machinery, by Arthur W. Roehm, 5791 Somerset avenue.

DETROIT — Buckeye Wood-Work Corp., 1320 Fourth street, has been formed to do general manufacturing, by Otto S. Sabine, 1272 Fifteenth street.

GRAND RAPIDS, MICH.—Modern Brewing Co. is planning to erect a $100,000 brewery here. George Fuchs, Detroit, is architect.

MUSKEGON, MICH.—Naph-Sol Refining Co. is planning to erect a $200,000 crude oil cracking unit, providing for a daily production of 25,000 gallons of gasoline. Walter E. Anderson is president and general manager.

TRENTON, MICH.—Trenton Valley Distillers Corp. is having plans prepared by George Diehl, 120 Madison street, Detroit, architect, for a rack warehouse and bottling plant. Unit heaters and a 75-horsepower steel boiler will be installed.

Indiana

COLUMBIA CITY, IND.—Columbia Foundries Co. has been incorporated to engage in the manufacture of automotive parts, by William C. Thomson Jr., Nellie Mae Thomson and William C. Thomson.

ELWOOD, IND.—Continental Can Co. Inc., Pershing Square building, New York, will erect a new factory here to cost $500,000. The plant is to be completed and in operation in time for the next canning season.

Illinois

CHICAGO—Imperial Die Casting Co., 4717 West North Avenue, has leased a 1-story building at Fulton and Francisco streets.

CHICAGO—Mills Novelty Co. plans the erection of a $100,000 plant adjacent to its present building at 4110 West Fullerton avenue. Austin Co. has the general contract.

CHICAGO—Franklin Stamping Corp., 622 West Lake street, has been formed by Morton J. Franklin, Mildred S. Greenhouse and Fannie Greenhouse, to manufacture and deal in metal stampings. Correspondent: Frank E. Shudnow, 33 North LaSalle street.

CHICAGO—Modern Air Conditioning Corp., 2510 Irving Park boulevard, has been incorporated by George H. Dahlquist, Stanley F. Lundquist and J. H. Taylor, to manufacture and install air conditioning equipment. Correspondent: Goldman, Alshouse & Healy, 5 South Wabash avenue.

KANKAKEE, ILL. — Kankakee Foundry Co. Inc. has been organized by F. A. Schneider, Leona Suttelle and Edward C. Schneider, to conduct a foundry. Correspondent: Everett Lewy, Rosenberg, Toomin & Stein, First National Bank building.

ROCK ISLAND, ILL.—Bear Mfg. Co. has begun construction of a 2-story addition to its plant. This increase of manufacturing facilities is necessitated by the company's rapid business expansion.

Georgia

ATLANTA, GA.—Georgia Power Co., Preston S. Arkwright president, is reported to have a budget of $10,987,967 for improvements in 1935.

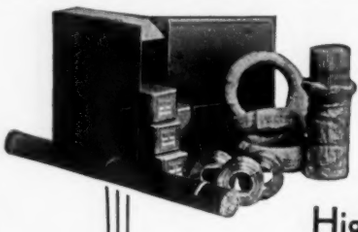
Kentucky

FRANKFORT, KY.—Schenley Distillers Corp., Cincinnati, Cary J. Fisher, consulting engineer, is planning to erect a building here.

FRANKFORT, KY.—Cliffside Distillery Inc. has been incorporated with $125,000 capital by J. M. Perkins and Ralph E. Mills.

LOUISVILLE, KY.—Louisville Gas & Electric Co. plans transmission line in Pewee valley district, with power substation facilities for electric light and power service.

MAYSVILLE, KY.—C. A. Stizel, representing a Chicago syndicate, has acquired the old H. E. Pogue Distillery and is planning to install new machinery.



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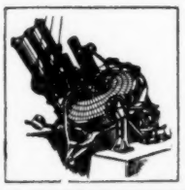

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Mississippi

LYMAN, MISS.—Batson-Hatten Lumber Co. is considering establishment of a $250,000 turpentine plant for processing wood turpentine, wood rosin and by-product from top wood and stumps. The present mill building will be converted into a wood reduction plant.

PASCAGOULA, MISS.—Martin Veneer Corp. has started work rebuilding its burned veneer plant and saw mill. R. K. Hollister is local manager. (Noted Nov. 26).

Virginia

RICHMOND, VA.—Virginia Fruit Brandy Distilling Corp., 721-729 Central National bank, R. T. Lipscomb, 1117 West avenue, manager, will begin construction early this month on a canning plant, to cost approximately $100,000.

Missouri

MARYVILLE, MO.—Imperial Brewing Co., Kansas City, Mo., is considering erecting new multi-unit brewing plant here. Cost is estimated at over $100,000

Oklahoma

YUKON, OKLA.—Dobry Flour Mills Inc., recently organized, T. A. Dobry president, plans installation of motors and controls, conveyors, elevators and other equipment in multi-story flour and grain mill. Cost about $400,000. (Noted Dec. 3).

Texas

DALLAS, TEX.—Pollock Paper & Box Co. is planning to install motors and controls, conveyors and other equipment in its new plant addition. Cost about $100,000 with machinery.

Wisconsin

MILWAUKEE—Globe Wire & Iron Works, 1027 West Atkinson avenue, has changed its name to Globe-Van Doorn Corp.

MILWAUKEE—Delta Mfg. Co., manufacturer of paper testers, saws and woodworking machinery, will occupy a new factory building on East Vienna street to be built by the Bischoff Realty Co. at a cost of over $100,000.

MILWAUKEE—Ruemelin Mfg. Co., manufacturer of sandblast equipment, recently incorporated, has awarded contracts for construction of a 1-story office and factory building, 80 x 120 feet, at 3860 North Palmer street. F. J. Hinton, 324 East Winconsin avenue, architect.

RACINE, WIS.—Standard Foundry Co., 1600 Kewaunee street, has awarded contracts for alterations and additions to its plant. A. A. Wickland Co., 205 West Wacker drive, Chicago, engineer.

WAUSAU, WIS.—Minnesota Mining & Mfg. Co., manufacturer of abrasives, William L. McKnight president, St. Paul, is having plans prepared for a 30 x 300-foot storage building and head house, to cost $200,000. The expansion program will call for 200 one-car steel bins, belt elevators, conveying machinery and other equipment. Toltz, King & Day Inc., 1509 Pioneer building, St. Paul, engineer.

Minnesota

MINNEAPOLIS—Northwestern Bell Telephone Co., Frank Bracelin general manager, will spend approximately $2,700,000 in 1935 for improvements and replacements to plant and equipment in and near Minneapolis.

MINNEAPOLIS — Minneapolis, St. Paul & Sault Ste. Marie Railway Co. will add between 110 and 125 men to the locomotive and car repair departments of its various shops, and this program throughout the system will probably mean an additional payroll of about $300,000 and will entail heavy purchases of materials and equipment.

RED WING, MINN.—S. B. Foot Tanning Co., E. H. Foot president, has awarded contracts for construction of a 3-story tannery addition, 60 x 100 feet.

Iowa

BETTENDORF, IOWA — Bettendorf Co. is expected to reopen its car shop and foundry within the next few months, according to J. H. Bendixin, vice president and general manager.

DUBUQUE, IOWA—Chicago, Milwaukee, St. Paul & Pacific Railway Co. has awarded contracts for construction of an oxyacetylene generating plant on Garfield avenue.

DUBUQUE, IOWA—Ede Robe Tanning Co., West Main and Jones streets, is making alterations to its tannery to cost $20,000, and will install new motors, shafting and belting, wood tumblers for cleaning and curing hides, and other equipment.

Colorado

GOLDEN, COLO.—Adolph Coors Co., Adolph Coors president, is contemplating spending $500,000 in an expansion program to its brewery, including construction of a 4-story storage building. An order has been placed with the A. O. Smith Corp., Milwaukee, to fabricate 28 glass-lined steel storage tanks.

Montana

VIRGINIA CITY, MONT.—Gilbert Brewing Co. has been incorporated with capital of 50,000 shares of preferred stock to operate a brewery here, by Valentine Gilbert, G. A. Harmon, F. W. Black, W. H. Thomas and H. G. Albright.

Pacific Coast

LOS ANGELES—Wehle Brewing Co., New Haven, Conn., plans new multi-unit brewing plant on site now being selected here, with equipment for initial capacity of 150,000 barrels per year. A power house will be built. Cost is estimated at over $200,000, including machinery.

GRAND COULEE, WASH.—F. A. Banks, construction engineer, Reclamation bureau, has announced that purchases to be made in the near future for the Coulee dam project will total $20,000,000 in materials and $5,000,000 for dam facilities and power equipment, including 12,500 tons of reinforcing bars, 3200 tons of gates, 500 tons of bulkhead gates, 1250 tons of butterfly valves and operating machinery, 400 tons of penstocks, 2200 tons of trash rack metal work, 800 tons of structural steel and 200 tons of miscellaneous metal.

SEATTLE — Chromium Mining & Smelting Corp., 819 Arctic building, has been incorporated at $60,000 by E. C. Moffitt and associates.

Dominion of Canada

TRENTON, N. S.—Eastern Car Co., subsidiary of Nova Scotia Steel & Coal Co., is reopening its plant to start work on a $325,000 order for coal cars.

BRANTFORD, ONT.—Brant Metallic Casket Co., branch of the Mid-West Metallic Casket Co., is establishing a plant here.

TORONTO, ONT.—Canadian Acme Screw & Gear Ltd. is moving to larger quarters in the building of the plant formerly occupied by Willys-Overland Ltd. in West Toronto.